CAMBRIDGE
PLANNING PROPOSALS

A Report to the
Cambridgeshire County Council
by

WILLIAM HOLFORD and H. MYLES WRIGHT

CAMBRIDGE UNIVERSITY PRESS

CENTRAL CAMBRIDGE, 1949.

The river and the Backs are on the left and the road called "the spine" in this report runs diagonally across the picture.

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A Report to the
Town and Country Planning Committee of the
Cambridgeshire County Council

by

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The late Alderman W. C. Jackson, J.P., and Councillor Mrs. D. M. Tharp also served on the Committee.

INTRODUCTION

THOSE who are called upon to tamper with other people's houses need to approach their task with care and confidence. Proposals which may alter the physical pattern, the daily habits, and eventually the character of a town must above all else be careful and informed. Confidence is no less necessary if the proposals are to set in motion the complicated machinery of agreement and collaboration which is necessary to carry out the least part of them.

Especially is this true of Cambridge, which is more than a town, more even than the market for a county and the centre of a region. It is a University, and stands before the world as an exemplar of the collegiate system, with all the ideas and attitudes to life which that ancient system implies. Its modes of thought and life have for centuries been reflected in its ways of building, and many of these ways are special and valuable and can be applied with benefit to the planning of towns elsewhere. The Cambridge tradition is cherished by the present inhabitants, not merely as something to be preserved but to be continued. Planners who suggest improvements must therefore be certain either that change is inevitable or that clear advantage is to be gained from it. There is bound to be objection to changes that disturb historic associations or threaten the particular amenities which many different societies in Cambridge enjoy, and there will be serious opposition if it is proposed to change without strong reason conditions of life and work and movement that do very well as they are.

Of all this we have become increasingly conscious during our study of Cambridge and its neighbourhood in the past two years.

We have also become convinced that certain changes are inevitable and others should be helped into being. It may be thought there is no urgency about plans for the future of a town that has no war damage, no unemployment and no major project for expansion, and it is true there is no urgency of this kind. The need for thought about the future of Cambridge is occasioned by even more fundamental things than these.

We believe Cambridge is moving quickly towards a new phase of its existence: a movement which will be none the less decisive for being unregarded by most of its citizens. Incomparably beautiful in many things, miserably defective in others, Cambridge is still one of the most pleasant places on earth in which to live. Moreover, it is now perhaps the only true "University town" in England. The question is whether it can control its own destiny in the face of a multitude of unplanned events that will certainly tend to change it. When these changes come, and even before they take place, can they be arranged to maintain and enhance the essential character and virtues of the town? This is the question we try to answer in this report to the County Council.

The County Council, as the Planning Authority, are due to submit to the Minister of Town and Country Planning, within the next two years, a Development Plan for Cambridgeshire. They have decided to prepare the Plan in two parts, of which the first, covering the town of Cambridge and neighbouring land and villages, is the subject of our proposals. The area with which the proposals are concerned is shown on Map 1 and contains at present about 104,000 inhabitants.

The growth and future size of Cambridge are in our belief the determining factors in any plan. In the past two years a great deal of information has been obtained about life in Cambridge, and proper provision for each aspect of it—whether houses, livelihood or University—seemed to us to

turn on future size. Many things that are commonplace in Cambridge would be luxuries in almost every other town : the return home to lunch, the compactness of the centre, the open spaces and liberal gardens and allotments. Some increase of population would enable most of these advantages and the general character of the town to be retained. We are sure that a large increase would mean their gradual forfeiture and would call for quite a different plan.

Cambridge's population has grown by about 16 per cent. in eleven years and we believe that a rapid growth is likely to continue, and even to accelerate, unless special effort is made to prevent it. This effort seems to us both nationally and locally desirable. One cannot make a good expanding plan for Cambridge. If, however, the citizens of Cambridge decide that they are out for quality—to make the best possible town of 100,000 or even 125,000, and then stop—then we think there is every hope of making Cambridge something very fine, not only in the centre but in its suburbs, in East Road and along its approaches. Certainly if this decision cannot be taken and carried out in Cambridge, it cannot be carried out in other towns that have far less compelling reasons for limiting their growth, and are able to summon far less influential aid if they decided to do so. That there should be a resolute effort to slow down migration into the Cambridge district, and to reduce the high rate of growth so that future population should not greatly exceed present figures, is our first and main proposal and permeates all others. It is one that could only be executed by agreement among county, town, university and central government. And such agreement seems to us in the interest of all four.

If probability of rapid growth is the gravest problem in the planning of Cambridge the most urgent is that of traffic. However many new jobs may be offered in Cambridge, or however attractive it may be to retired people, a great shortage of houses will put a powerful brake on population growth for a decade or longer. No similar postponement of traffic difficulties can be relied on. More plentiful petrol or more new cars might cause acute congestion in the central area within a few years.

The central area of Cambridge, shown on Maps 3 and 12, is small and cramped within a ring of Colleges. Before the war, Colleges were still extending within it and when a commercial building was replaced it was usually by a higher one ; and traffic pushed through with difficulty. Traffic has grown tenfold since 1911, but streets remain the same and their surplus capacity is now used up. During the war there was a fall in traffic volumes but now the number of vehicles on the roads has passed 1939 level and is once again climbing.

In the past, road improvements in Cambridge have been considered piecemeal. We determined that this mistake at any rate was one we would avoid, and we set out to see the traffic problem comprehensively, and to establish the existing relations between traffic and traffic flows of all kinds both in the centre of the town and on its approach roads. With the help of all those officially concerned with traffic, information has been collected which has enabled our proposals to be based on much fuller knowledge than has been available hitherto. This information is set out in the Appendix.

Our proposals rest on these two bases of a limit of size and a comprehensive road framework in scale with that size. They may be broadly summarised as follows :—

(1) We outline a definite policy of controlling the physical spread of Cambridge and nearby villages, with the aim of maintaining their present general character while allowing for necessary changes and some general growth. Sites for housing and other new buildings have been chosen to encourage reasonably compact development, to keep the sequence of open spaces along the river and to prevent neighbouring villages becoming merged in the town.

(2) We believe that bypasses far out from the town will not be justified in the near future. We propose that in the meantime through traffic should be led round the inner districts along two partially new routes.

(3) We propose a relief road down the east side of the centre (the side where most people want to travel) which would connect at its south end with an improved cross-town route. In time the two roads would become the boundary of a precinct, containing the old town centre and preserving its market-town and pedestrian character and architectural form. We provide for a new shopping street and a new bus station which would enable the present commercial centre to serve the town efficiently for many years provided that no runaway growth of population takes place.

These proposals are described in the chapters which follow and are put forward as a general framework for a statutory Development Plan for Cambridge. We hope to supplement our main report by some studies of matters of consequence to Cambridge which we have not so far had time to consider, including landscape along the river and the Backs and particular redevelopment problems near the centre.

Finally there is the question of finance. At a time when economic difficulties are in everyone's mind a plan which requires for its completion the execution of a number of costly works may be opposed on that ground alone. We think this attitude would be wrong. It seems to us that the fundamental requirement of planning proposals is that they should be in scale with the town ; by which we mean that they should neither be grandiose nor niggling when compared with the developments of the past 30 years, and with what seem reasonable prospects and needs in the future under normal economic conditions. Proposals which have survived this test are likely to be of the same order and cost, although not the same in kind, as the works that would in fact have to be executed if there were no plan. We are quite sure this is the case in Cambridge. Such proposals may of course be carried out more slowly or faster, as opportunity serves.

Secondly, a plan for a town, to a very large extent, merely ensures a good relationship between developments that would happen in any case, and in so far as it does this, a plan costs nothing beyond the wages of those who make it and administer it. We stress this as a point often overlooked. In the next 20 years Cambridge will inevitably build many houses, schools, shops, and University and College buildings, and provide access roads and services for them ; and the cost of all these cannot be included in the costs of planning. Apart from administrative expenses, the true cost of planning improvements in Cambridge, in terms of the charges that will fall upon the rates, may be said to comprise :—

(1) the cost of road improvements outside areas of comprehensive redevelopment ; and

(2) the difference between public expenditure within areas of comprehensive redevelopment on the one hand, and on the other the receipts from Exchequer grants towards this expenditure and from ground rents and other income.

In order that the County Council should have some broad guidance on cost to assist them in judging our road proposals we have included in the report (in Table 1) a rough comparison of the cost of the different proposals. This comparison covers road improvements only ; and where a road improvement is within an area proposed for comprehensive redevelopment we have allowed for a contribution (on behalf of road improvements) towards the cost of general redevelopment.

The time and resources available during the preparation of our proposals did not allow us to go beyond this rough and partial estimate. But we think it very desirable that before the County and Borough Councils pass final judgment on the whole of the proposals they should have before them an estimate of the rate burden which the execution of the proposals would entail ; and it seems to us proper that this estimate should be prepared by the County Treasurer, in collaboration with the Borough Treasurer and Borough Engineer and Surveyor. We are aware that the estimate could only serve as a general guide, since it must be based on assumptions whose validity cannot be guaranteed. But it would be very valuable, similar estimates have been prepared elsewhere and we should be happy to give any assistance we can in its preparation.

Lastly, we are very conscious that the only real success of a plan is success in execution, and that in Cambridge this will require the agreement and support of the county, town and University. We do not underestimate the difficulties in the way of this agreement. Agreement on a plan for any town is faced by two great obstacles. There is first the temptation to avoid remedies which would involve controversies and disturbance, in the hope or belief that the evils which they seek to correct have been exaggerated, or that by postponement they will become so much more obvious that opposition to the remedies will diminish. Secondly, persons or bodies whose interests are adversely affected by

the proposals very naturally and properly oppose them strenuously. But the converse is not true. In these busy times those who would benefit from planning proposals do not, save in rare instances, lend their support to the Planning Authority; they turn again with relief to their own concerns. Thus in any area, even where one authority has predominant influence, agreement on proposals that would involve appreciable changes is difficult. It is bound to be much more difficult in a town where three powerful bodies have interests which, in the nature of things, cannot be identical.

We believe, however, that nearly all of those who will judge our proposals will be agreed on one thing: that when new buildings, roads and services to the value of £8 million (and probably a much larger sum) are certain to be executed in Cambridge during the next 20 years, they should be built in accordance with a general planning framework which has been examined and accepted on behalf of all who live and work in Cambridge. We put forward our proposals as a basis for this framework. We claim two merits for them. They have been prepared comprehensively for Cambridge as a whole, with a full knowledge of day-to-day planning problems but without being subject to administrative or other urgent pressures this way or that. Secondly, the County Council is enabled to see the whole of the proposals at one time, and in relation to one another, while still being free to accept, reject or modify them.

ACKNOWLEDGMENTS

We wish to record our gratitude to the many people, authorities and societies who have helped us in preparing our planning proposals for Cambridge by giving information and advice, and to those who have been our colleagues in the work. Almost every public body in Cambridge, as well as the University and all the Colleges, has assisted us in this way and many have supplemented discussion of their problems with written information.

We are indebted first of all to Dr. R. M. Jackson and Mr. M. C. Burkitt, successively Chairmen of the Town and Country Planning Committee of the County Council, for the arrangements they have made for our work, which could not have been bettered. Any faults in our methods of work or the conclusions we have reached are entirely of our own making. We also wish to thank Mr. Charles Phythian, Clerk of the County Council, for his share in making these arrangements.

We express our thanks to the Mayor of Cambridge (Ald. W. G. James) for the information and assistance supplied by the Borough and for giving us full opportunity to explain our proposals to members of the Borough Council. Particular mention should be made of the benefit we have derived from the great knowledge and generous help of the Chief Constable (Mr. B. N. Bebbington) on matters of traffic. The Borough Surveyor and Engineer (Mr. T. V. Burrows) has also been good enough to supply us with information on many subjects. Our information on Borough housing was provided by the Surveyor, by the Housing Officer (Mr. S. Beldam) and by the Chief Sanitary Inspector (Mr. D. Bottom).

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Our collaboration with the County Planning Officer (Mr. W. L. Waide) and members of his Department calls for special note. With the exception of one or two drawings, all work on the planning proposals and the preceding survey was carried out in the County Planning Department, side by side with control of current development and day-to-day administration. We thus had at our disposal the whole of the knowledge and records of the Department, and were enabled to check long-term proposals for each district against the pattern of development applications since the end of the war.

It has been decided that we should be regarded as the authors of all proposals. The County Council will wish to examine the proposals in detail and probably make changes before sending them forward for the Minister's approval. This examination will cover many technical matters, and it was thought desirable that the County Planning Officer should be free to advise the Town and Country Planning Committee of the County Council in this part of their work without the possible embarrassment of being formally the author of any of the proposals. With this qualification our work with Mr. Waide and his Department on the plan for Cambridge has been a collaboration in the full sense. He has enabled us to work on the proposals undistracted by the mass of administrative detail which the Act has imposed upon the Department ; he has suggested many new lines of thought ; and in particular he has found time to suggest and make arrangements for the collection of nearly all the information that was needed. He has so managed that pressure of current work, however great, never interrupted the preparation of the proposals. We are very greatly indebted to him.

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We are also grateful to Mr. Brooke Crutchley and Mr. Dreyfus of the Cambridge University Press for their advice on printing and publication. Our report was completed in December and its discussion by a joint committee of the County and Borough began this month. For this reason the County Council desired that the report should be published as soon as possible, and the Planning Officer, with the help of the publishers and printers, arranged at short notice for the report to appear in this simple form with text and plans in separate volumes.

We express our acknowledgments to the Controller of H.M. Stationery Office for permission to reproduce many drawings based on the maps and plans of the Ordnance Survey, and to the following owners of the copyright of photographs :—

Cambridge Preservation Society : for photographs facing p. 8 (top) and p. 9 (top) ; John Carter Esq. : facing p. 8 (bottom) and p. 41 (centre) ; Messrs. Ramsey and Muspratt : facing p. 16 (top right and left), and p. 49 (top and bottom right) ; J. H. Cumberledge Esq. : facing p. 16 (bottom left) and p. 17 (top left) ; Messrs. Aerofilms Ltd. : facing p. 48 (top) ; and P. A. L. Brunney, Esq. : facing p. 48 (bottom) and p. 49 (bottom left).

W. G. H.
H. M. W.
January, 1950

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CHAPTER ONE

ROAD PROPOSALS

THE work of preparing a plan falls into the two broad divisions of survey—the collection and analysis of information on which proposals will be based—and that of arriving at the proposals themselves. It follows that in preparing a planning report one must decide on how much of the survey material ought to be included, either as a record of conditions at a given time or to assist readers to judge the merits of the proposals. In general, we have tried to reduce the survey information in this report to the least that would serve as an adequate background to the proposals; but we thought that road traffic required fuller treatment. Road traffic in Cambridge is a matter of great local, and in some respects national, interest, and some of our proposals are bound to arouse controversy. We have therefore described them and our reasons for them in more detail than the other proposals in this report. This being so, it seemed to us that the results of the road traffic survey, on which our proposals are based, should also be described in some detail; and this has been done. The bulk of our information on traffic is printed as an Appendix to the report, together with the necessary maps. A short note on the growth of the Cambridge road pattern and major improvements proposed in the past has been included in paras. 13–21 as a preface to our own proposals.

Preliminary assumptions

2 In looking for solutions to the various problems described in the traffic survey, many ideas have been examined—some of them novel. To guide our choice between these we found it necessary to make certain assumptions, which should be briefly stated because they moulded the final proposals and are matters on which the town-planner would be rash to claim any special value for his opinion.

Retention of the character of the Town

3 The first assumption was that our proposals should not call for a major change in the character of central Cambridge. By this we meant, among other things, that the main shopping centre would remain within the ring of Colleges for the 20 years covered by our proposals, that the College buildings (not tall by modern standards) should keep a suitable pre-eminence among surrounding buildings, and that major street improvements should not be sited where they would make a great change in a famous view—of which there are many in Cambridge.

4 Because this assumption may be reassuring to many who love Cambridge, it is perhaps necessary to point out its implications and limitations. It meant that several of the largest proposals would be for improving access to and circulation in the centre of the town and that some sacrifices must be made for this purpose. But it also meant that preparations should be made for an extension of the commercial centre outside the present central area should this become necessary. There were 104,000 people in Urban Cambridge last year (86,000 in the Borough). Demand for increased " central area services " may come from a growth in population, from more petrol and cars, or from a continued increase in the numbers of rural population who travel to the centre. The latter tendency has been most noticeable in the last decade: the number of people travelling to Cambridge by country buses has approximately doubled. Despite the force of tradition which will tend to keep the main shops and offices where they are now, we do not think the central area can efficiently serve a much larger population and keep its present character. For reasons we give in para. 273 we believe there is a likelihood of a large increase of population unless special measures are taken to prevent it. We have therefore tried to plan several of our major road improvements so that they will reduce congestion in the central area and also encourage in due time the growth of a central area extension in the Emmanuel Road area, near the centre of gravity of the whole town. This question is further considered in paragraphs 89 *et seq*.

Proposals to be moderate in scale and cost

5 The second assumption was that the proposals should be moderate in the surrender of land and changes of land use which they would require, and also in cost. We meant more by this than a resolution to avoid controversy and to make one shilling do the work of two. We meant that the proposals should be very carefully measured to what we thought Cambridge would be able and willing to do in the next 25 years or so.

6 Cambridge has not been blitzed and the pace of redevelopment before the war was slow. Moreover, land and views and the character of particular districts are almost certainly thought about and cherished in Cambridge more than in most other towns. The cumulative effect of these three factors must delay the construction of a new road which cuts across the existing pattern of streets and land uses. A proposal which makes the maximum use of existing routes is likely to be carried out much sooner.

Costs of road improvements: pre-war and future position

7 We have also felt that the sums likely to be available in Cambridge for main road improvements in the next 20 years will be limited. There is no need to enlarge much on this. National expenditure on roads is likely to be kept low for a number of years, and blitzed cities, national

trunk routes and improvements on the outskirts of the largest cities must receive the lion's share of the funds available. Cambridge would therefore be wise to try to obtain the best results from a moderate expenditure during this period.

8 In looking for some yardstick to measure moderate expenditure, attention was naturally turned to expenditure in past years. We found that from 1926 to 1940 about £660,000 was spent in the Borough on road improvements, including new roads and bridges and excluding development roads within housing estates.* Civil engineering costs are at present a little more than twice those ruling in immediately pre-war years. Against this costs of land acquisition and compensation are likely to be less in future than in pre-war years, and there is always the hope that civil engineering costs may fall somewhat below their present level. Thus if the same average amount of work were carried out each year for the next 20 years as was carried out between 1926 and 1940, the total cost might well lie between £1,480,000 ($1\frac{3}{4}$ times pre-war cost) and £1,760,000 (twice pre-war). It remains to be decided whether expenditure on this scale can be called moderate in view of the developments that will probably take place in Cambridge before 1970.

9 The decision taken on this question may be less influenced by considerations of local finance than was usual in most towns before the war. Pre-war gross expenditure on road improvements was offset in part by grants from the Ministry of Transport and in part by levies on frontages. Although levies will be fewer in future both they and Ministry of Transport grants will continue. But in addition the Town and Country Planning Act, 1947, expects local authorities to designate areas of obsolete development with a view to their acquisition for redevelopment as a whole, and grants will be made by the Ministry of Town and Country Planning towards the cost of land purchase and clearance. By using the 1947 Act, large road improvements may be made in certain parts of the central area at much lower cost than was possible before the war. The burden to the rates of an expenditure of, say, £1,500,000 on road improvements during the next 20 years could not be estimated during the preparation of our proposals, but it seems clear that grants under the 1947 Act would meet a considerable portion of the cost, and that a local authority need no longer be debarred from carrying out necessary improvements in central areas because of their initial cost.

10 We have said that we could not prepare an accurate picture of the net cost of road proposals. These costs would be entangled with those involved in comprehensive redevelopment. We have suggested in the Introduction that an estimate might be made, based on certain assumptions, of the charge on the rates that would result from the execution of the whole of our proposals, and we should be glad to assist the Treasurers and Borough Surveyor in this work. When such a full estimate has been made it will probably prove possible to work backwards to the approximate cost of road proposals alone. But when preparing our proposals we had neither the information nor the time for so complex a calculation. On the other hand we were anxious, for our own guidance, to find some method of comparing the costs of different proposals and by which we could feel at least some confidence that the total cost of our proposals would not be unreasonable.

Table of Comparative Expenditure

11 The solution we adopted was to keep in mind £1,500,000 as the total sum which it would be reasonable for Cambridge to spend on new traffic roads and improvements in the next twenty years and to allocate a portion of this sum to each improvement. Sums so allocated are towards the cost of road improvements alone. In some cases a road improvement is likely, in our view, to be the only improvement needed in that area. In other areas road improvements would form only part of a scheme of new layout and redevelopment, and in these cases the sum we allocate is only a contribution (on behalf of road improvements) to the total cost. These allocations (set out in Table 1 at the end of the report) were prepared for our own use and we did not originally intend to include them in our report. We have decided to do so in the belief that they may assist the Committee by showing them which improvements, in our view, will be less, and which more, expensive. They should not be regarded as accurate estimates of the cost of any particular item and they do not take account of any recoupment of expenditure by way of grant or levy.

Special measures of control

12 The third assumption was that less usual methods of relieving traffic congestion should not be ruled out. Cambridge is a special town and deserves a special effort to relieve congestion in places where road improvements and provision of more attractive routes could not be relied upon to do so unaided. Some measures of this kind are included in our recommendations.

GROWTH OF THE ROAD PATTERN AND PAST PROPOSALS

13 We have thought that it may be of assistance to the Committee if we preface our proposals with a short summary of the growth of the existing road pattern in Cambridge, including larger road improvements proposed in the past.

* We are indebted to the Borough Surveyor's Department for helping us to make this rough estimate. Financial summaries before 1926 are not in a form suitable for making such estimates, and even from 1926 onwards the distribution of items between maintenance and new work is liable to error unless reference is made to the original documents. The figures quoted are, however, believed to be broadly correct. Widenings and realignments and new construction have been included as new construction, while re-surfacing has not. Improvements include land acquisition (including some for improvements not yet executed), compensation, labour and materials.

Roads in 1830

14 Cambridge owes its origin to its position at a convenient crossing of the river on the southern fringe of the Fens, and its road pattern has evolved from tracks between the several settlements which grew up on the gravel terraces near the crossing. The oldest portion of the town is on the north side of the river near Castle Hill. It later spread to the south side of the Great Bridge (Magdalene Bridge), and for several centuries these two settlements, with hamlets at Barnwell, Chesterton and Newnham were all that occupied the present Borough area. Map 2 shows in *solid black* lines the streets which existed in 1830 and in *black double* lines the highways and country roads at the same date. It will be seen that there were only two bridges open to the public—the Great Bridge and the Small Bridge (now Silver St. Bridge)—and that, as one would expect, the main skeleton of the present road system was in existence. The chief highways converged on the Great Bridge, three from the north and three from the south. Silver St. Bridge was approached by only one road, Barton Road, of less importance.

1830 *to* 1906

15 Between 1830 and 1906 the town grew steadily in population, from about 20,000 to about 48,000, and the larger number of new streets (see Map 2, *red lines*) were south of the river. This is readily explained by the coming of the railway, which killed river transport and led to the building of Romsey Town; and by the convenience of being on the same side of the river as the town centre. The areas between Hills Road and Mill Road and in the angle between Hills Road and Cherry Hinton Road were also developed in the latter half of the last century.

Victoria Bridge

16 A less expected feature of the growth of Cambridge between 1830 and 1906 was the large amount of development north of the river between the spine* (Huntingdon Road–Castle St.) and old Chesterton. One reason for this development was lower local taxation (the area was then Chesterton U.D.). Between 1831 and 1891 the population of Chesterton U.D. rose from 1,500 to 7,000. Thirteen ferries served direct pedestrian routes between Chesterton and the town centre, but all wheeled traffic had to make the big detour *via* Magdalene Bridge. The inconvenience was naturally resented by Chesterton residents and in 1889 the Cam Bridges Act was passed to meet their complaints. The Act provided for the building of Victoria Bridge and another bridge farther downstream. Victoria Bridge was built in 1890 (at a cost of about £10,000) and Victoria Road was laid out at the same time both to increase the attraction of Victoria Bridge for traffic originating near its northern bridgehead and also to attract traffic moving between the Huntingdon and Histon Roads and the Newmarket Road area. The complete scheme of Victoria Road, Bridge and Avenue was a well-thought-out attempt to make Victoria Bridge and Avenue serve two purposes—a connection between north and south, and a route onto which a good deal of spine traffic could be deflected. Sixty years later it does serve both these purposes, though not equally well. Victoria Avenue is the principal river crossing and the most heavily trafficked route in Cambridge for motor vehicles. Victoria Road also carries a fair amount of traffic at present and deflects from the central area that portion of Huntingdon Road traffic which is bound for Chesterton and the Newmarket Road area. It does not, however, act as a central area bypass for traffic up and down the spine, and the narrowness of its carriageway, its frequent obstruction by standing vehicles and the southward hook at its west end diminish its attractions.

Chesterton Bridge proposed

17 The building of the second bridge authorised by the Act (called Chesterton Bridge in the remainder of this report) was not proceeded with, probably in order to make sure what would be the best site for it by studying the effect of the Victoria Bridge for a few years. The opening of Victoria Bridge stimulated building development in the Chesterton area and this in turn led to a demand for the building of the second bridge. Chesterton U.D. became part of the Borough in 1911 and when this occurred Chesterton electors were promised that Chesterton Bridge would be built before 1917. But for the outbreak of the 1914–18 war this would probably have been done.

18 Streets and roads constructed since 1906 are shown on Map 2 by a *buff* line and nearly all of these streets date from the 1919–39 period—a period of the same length as that covered by our present proposals. The links between the old radial roads constructed at some distance from the centre were the major inter-war improvements. In this category come the east Cambridge bypass (Fendon, Mowbray, Perne and Brooks Roads), Queen Edith's Way, Gilbert Road, Arbury Road and Fen Causeway. These roads are both useful local links, and, taken together, they must deflect considerable traffic away from the inner areas of the town. It is noticeable, however, that the length of development roads constructed during this period north of the river was little less than that on the south, and this fact is reflected in the small but steady growth in the proportion of population living north of the river—from 26% (12,000) in 1901 to 29% (19,000) in 1931. In consequence the Chesterton Bridge project was revived and the merits of several different routes were examined by the Borough Council between 1921 and 1928.

19 In 1928 the Surveyor made a comprehensive report on three routes—Gant's Ferry, Walnut Tree Avenue, and Abbey Road—each being estimated to cost about £60,000. He pointed out that the Borough was still under an obligation to construct the bridge, that costs

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* Frequent mention of "the spine" is made in this report. By this phrase we mean A604, which enters the town from the north-west as Huntingdon Road and having become successively Castle St., Magdalene St., Bridge St., Sidney St., St. Andrew's St. and Regent St., runs through the rest of the town and out of it as Hills Road. It has always been the spine of the town.

had doubled since the scheme was first proposed and that building development was steadily making the construction of any bridge more difficult and costly. No action was taken on this report, possibly because by 1928 the East Cambridge Town Planning Scheme was in force and the idea of the east Cambridge ring road, with a river crossing south of Cam Causeway, had gained many adherents, and perhaps partly for the reason mentioned in the next paragraph. We advocate later in this report the construction of Chesterton Bridge on the Walnut Tree Avenue line as soon as possible.

West Cambridge

20 The only major traffic improvement ever made on the west side of Cambridge is Fen Causeway, built in 1924–26. A glance at Map 2 shows that when central streets, and especially Trumpington St. and Trinity St., became congested, there would be a strong temptation to use the Backs road as a bypass by linking it, or Barton Road, with Trumpington St. The main reason for a new route across the river appears, however, to have been relief of Silver St. rather than a central area bypass. The maximum traffic on Silver St. in *one hour* in January 1924 was 249 motor and horsedrawn vehicles and 666 cycles. (This compares with 104 m.v. and 372 cycles in the peak *half-hour* in January 1949. Figures for the peak hour are not available.) Various lines for this relief route had been considered in earlier years (notably in 1910). These included a bridge at the west end of Mill Lane across Laundress Green, no less than six routes starting from Coe Fen Lane and two routes more or less on the Chaucer Road line. At the public inquiry in 1924 there was opposition to the Fen Causeway line on the grounds that it would spoil Coe Fen and that the Chaucer Road route was preferable. Against this it was stated that residents in the southern portion of west Cambridge wanted a quick route to the central area and objected to a detour *via* Chaucer Road. Fen Causeway may perhaps be regarded as a compromise between a bypass and a local link. It was built largely by direct labour (as a means of unemployment relief) and cost £40,000 against an estimated £24,000. There was some sharp criticism of the excessive cost, and this probably contributed to the postponement of the Chesterton Bridge proposal when it was revived in the following years. Road works carried out subsequently were largely confined to those of which the cost could be recouped by a levy on frontages.

21 We think the conclusions to be drawn from Map 2 and study of past proposals for road improvements may be summarised as follows: —

(i) A very large number of new streets have been laid out since 1830 and nearly all of these were to provide frontages for dwellings to house a population that has grown from 20,000 to 86,000. Until 1919 there was no great need for traffic improvements other than bridges. Traffic volumes were low and most roads could adequately serve both as traffic routes and development roads.

(ii) Major improvements for traffic purposes have been few. The largest are Victoria Road, Bridge and Avenue, the Fen Causeway, and the partially constructed East Cambridge bypass. The cost of the latter was wholly recovered from frontagers, but its use as a development road has diminished its value as a bypass. The failure to construct Chesterton Bridge seems specially regrettable. 25,000 people now live north of the river and a big increase in their number seems inevitable.

(iii) Even when allowance has been made for the fall in the value of money, postponement for any length of time inevitably increases the cost of road improvements. The land required becomes built over and acquisition and compensation costs greatly increase. For example, Chesterton Bridge when first proposed was expected to cost about £30,000, in 1928 the estimate was £60,000 and today it might cost £100,000.

(iv) It seems certain that during the next 20 years improvements in traffic routes will receive greater public attention and will absorb a larger share of total expenditure on Cambridge roads than they have done hitherto. Up to now traffic congestion in Cambridge has not been widespread or very severe because the street system which existed in 1919 had a surplus capacity which could be drawn upon as traffic increased. It has been so drawn upon and is now exhausted —at least in the centre. In 1913 Magdalene St. carried 114 motor and horse-drawn vehicles in the peak hour; today it carries about 400 motor vehicles and 1,500 cycles. Victoria Avenue in 1913 also carried 114 vehicles in the peak hour: today it carries 670 motor vehicles and 1,370 cyclists. Short bursts of traffic of appreciably higher volume occur on both roads. There is little or no surplus capacity left to deal with that doubling of 1939 traffic volumes for which it is generally recommended that provision should be made.

22 It is against this background of past growth and proposals, and future possibilities, that we present the proposals contained in the following sections.

ROAD APPROACHES AND BYPASSES

Roads outside the Borough

23 Existing main and secondary roads in Urban Cambridge are shown on Map 3 and their connections with the regional road system on Map 44. We have so far made only a superficial inspection of roads and traffic outside the Borough boundary. Our impression is that the roads are adequate for the traffic they carry and that desirable improvements—such as elimination of level crossings—cannot be given a very high place in a list of

needs for Urban Cambridge as a whole. But before any list of works, such as that contained in the summaries in this chapter, is finally approved for Urban Cambridge, some improvements to existing roads between the Borough and Urban Cambridge boundaries should be considered for inclusion.

Ribbon Development

24 The most noticeable feature of the road approaches to Cambridge is the ribbon development. That along the Shelford Road is as long, continuous and unfortunate as can be found in any town of the size of Cambridge. On the Huntingdon, Histon, Milton and Newmarket Roads the lines are neither so long nor so continuous. Nevertheless they are a wasteful use of land, contribute to road accidents, obstruct main road traffic and are not a good introduction to Cambridge. Once carried out, ribbon development is almost impossible to remove. We therefore endorse the present policy of the Committee in this matter and recommend that permission should be refused for any extension of ribbon development along the road approaches to Cambridge. This refusal should normally extend to the filling in of gaps in existing ribbon development as well as to increases in the length of the ribbons.

Future through traffic

25 In examining possible traffic improvements in Cambridge a first question to be decided is whether through traffic is large or likely to become large, and if so, whether it can be kept outside the built-up area. The traffic survey shows (Appendix, paras. 6–11 and Map 46) that through traffic is not at present very heavy, and that nearly all of it circles around and does not enter the central area. Through traffic will certainly grow in the next 20 years; using the customary rule-of-thumb forecast, it may double in amount. It may even grow in proportion to terminating and local traffic—from one-fifth to, say, one-quarter of all traffic crossing the Borough boundary. On the other hand one should remember that as petrol becomes more plentiful through traffic in Cambridge may decrease in proportion to other traffic. Long-distance pleasure and even business traffic, which would run past other towns if it could, may make a point of not running past Cambridge. Even if the proportion of through traffic does grow it would still be small in proportion to other traffic (terminating and local) which circulates within the Borough. Nevertheless it would certainly be far better if through traffic did not enter the built-up area at all. The first question studied was therefore whether there was a good case for allocating any of the £1,500,000 during the next 20 years for outer ring roads that would enable through traffic to keep outside or very nearly to keep outside of the built-up area.

Outer bypasses not generally necessary in next 20 years

26 In broad terms, our view is that it would not be wise to construct outer ring roads or bypasses in the next 20 years if this is to be done at the expense of the other improvements we propose. We feel strongly that actual construction (as opposed to surveying and agreeing routes and reserving the land) should be confined in the next 20 years to new routes or links which would at once attract a large traffic and give relief to congested routes.

27 The bulk of through traffic does not enter the central area (see Map 46) but circulates on the "inner ring"*; and proposals other than outer ring roads can decrease the amount of traffic which comes in as far as the inner ring. Outer bypasses would be costly, and would in general attract little traffic other than through traffic. This general view calls for fuller statement or qualifications as regards the various bypasses shown on Map 4.

THE EAST CAMBRIDGE BYPASS

28 A portion of a bypass or ring road has already been constructed in east Cambridge from Hills Road to Coldham's Lane in accordance with the pre-war scheme (see Map 4). Although built up on both sides it is a very useful traffic route. Plans exist for the continuation of this road northwards to Newmarket Road, and later to extend it at both ends, to Milton Road and the Shelford and Royston Roads. Four-fifths of the present population of Cambridge live east of the spine (Huntingdon Road to Hills Road) and this proportion will soon be increased by the completion of housing schemes in the Coleridge Road, Queen Edith's Way and Arbury Road areas. A big improvement in road links between the various parts of East Cambridge is therefore needed. The completion of an eastern bypass road between Milton Road and Hills Road would be one such improvement. It would attract the through traffic on A10 (Milton Road to Royston Road) and in due course a good deal of local traffic.

Coldham's Lane to Newmarket Road; and Newmarket Road to Milton Road

29 Our immediate problem was whether to recommend the completion of the whole of the Coldham's Lane–Milton Road section within the next 20 years. We recommend that the Coldham Lane–Newmarket Road length should be completed in the first of the stages into which our road improvement programme has been divided (1951–55). We do not recommend construction of the Newmarket Road to Milton Road length (*via* Cam Causeway or some nearby line) during the next 20 years. It would require nearly a mile of new road, two crossings of embanked railways and one river crossing. The marshy ground near the river and the awkward rail-river crossings would mean that this link could not cost less than £300,000 and might cost more. The Chesterton Bridge crossing described later (paragraphs 62–70) is to some extent a substitute for the more eastern crossing; it would be much cheaper and would be used immediately by much more traffic. We therefore think that the east Cambridge bypass river crossing (between Milton Road and Newmarket

* We use the term "inner ring" to mean the existing route *via* Chesterton Lane, Victoria Avenue, Emmanuel Road, Park Side, Gonville Place, Lensfield Road, Fen Causeway and the Backs road.

Road *via* Cam Causeway) should not be constructed during the period we are considering but should be re-examined in the light of the obstruction that building development along Cam Causeway would offer to through traffic, and the many difficulties that beset any other river crossing in this neighbourhood.

Hills Road to Royston Road

30 The pre-war scheme also provided for an extension of the eastern ring road south-westwards from Hills Road to meet the Royston Road on the Borough boundary (Map 4). This would be a useful improvement and would keep A10 and some A130 traffic away from Trumpington if the river crossing from Newmarket Road to Milton Road is eventually carried out. But it demands a new railway bridge and 2¼ miles of new road, costing over £150,000. As the eastern ring road is already connected to Trumpington Road by Long Road—quite straight though not so attractive to through traffic—we do not recommend construction of the Hills Road to Royston Road connection in the next 20 years. We suggest, however, that the best line should be agreed and the land reserved.

31 Our proposals for an east Cambridge bypass may be summarised as follows: —

(i) *We recommend that the east Cambridge bypass should be extended during the first stage of our programme* (1951–55), *from Brooks Road–Coldham's Lane to Newmarket Road, and we allocate* £75,000 *towards the cost of this work in our table of comparative expenditure.*

(ii) *We recommend that the lines for the two remaining portions of the east Cambridge bypass should be surveyed and re-examined, and that if the Newmarket Road to Milton Road link appears practicable, the land should be reserved. These two portions are that on the north, from Newmarket Road to Milton Road; and the south-western extension from Hills Road (Fendon Road junction) to Royston Road on approximately the pre-war line. We do not recommend the execution of either of these extensions during the next twenty years.*

THE NORTHERN BYPASS

32 Through traffic across the northern portion of Cambridge almost wholly consists of that running between the Newmarket Road and the Madingley and Huntingdon Roads. Both routes have to zig-zag at Victoria Avenue but are otherwise fairly direct. Their main faults are that both run for several miles through the built-up area and the route carries a good deal of through traffic across the narrow Chesterton Lane–Magdalene St. crossing. A northern bypass road was proposed before the war to remedy this fault and to connect the five northern radiating roads along a line beyond the built-up area. (See Map 4.) There has been much discussion whether this bypass is needed and of the best line for it if it is needed.

33 At present about 230 through vehicles pass between the Huntingdon and Newmarket Roads between 7 a.m. and 6 p.m. and about 210 between the Madingley and Newmarket Roads—that is, about 20 per hour by each route. Interchange of through vehicles between other roads which would be linked by the new bypass is negligible— two or three an hour. The pre-war Draft Scheme route for the bypass between the Madingley and Milton Roads was about 4½ miles long and would cost today about £250,000 to construct. Moreover, the eastern bypass described in paras. 28–30 would be used by a good deal of local traffic moving between the various parts of east Cambridge, but only a small amount of local traffic would use a northern bypass. We propose later in this report that there should be no great increase in development in the area from the Histon Road westwards round to the Barton Road (see Map 3). If the Committee accept this proposal the case for the construction of the northern bypass will rest almost solely on its being needed as a bypass for through traffic and, of course, on its power to attract this traffic and keep it out of the built-up area.

Northern bypass not needed in the near future

34 From the point of view of Cambridge, and not that of the traffic, we think through traffic between the Madingley, Huntingdon and Newmarket Roads would have to increase a great deal before it would be worth while spending £250,000 on a northern bypass in preference to road improvements farther in. But we do not doubt that a northern bypass will eventually be needed, and therefore the route should be chosen and the land protected.

Past discussions of best route

35 The best route for the bypass has been much discussed in the past. From the Milton Road westwards to Histon Road a line farther in than the Draft Scheme proposal (Map 4) does not now seem possible and we believe the most suitable line could easily be agreed. From Histon Road westwards the question is much more controversial. We think the Draft Scheme route between Huntingdon Road and Newmarket Road would attract through traffic between those two roads; but we do not think that the Draft Scheme route between the Madingley and Newmarket Roads would attract A45 traffic—especially eastbound. Moreover, since the Draft Scheme was prepared the area east of Madingley Wood has become the American War Cemetery for the 1939–45 war. The American authorities have given great attention to the design and layout of the cemetery, which lies on the northern slope of the hill with a view over the fields to the north-east. Everyone will wish to ensure that the line of the bypass between the Huntingdon and Madingley Roads does not injure the view from the cemetery.

36 As we see it there are two possible alternatives to the Draft Scheme route. The first is to keep this route from Milton Road to Huntingdon Road and then continue westwards, curving downwards just east of Madingley village to join the A45 at about New Lane (see Map 4, *solid red*

line), thus keeping well away from Madingley Wood. This would attract both A45 and Huntingdon Road traffic but would add three-quarters of a mile to an already costly project. The other alternative is to seek a new line, nearer Cambridge, for the portion of the route between the Madingley and Histon Roads—for example the line shown by a *red chain* line on Map 4. This line would lessen the cost of the road but would have a number of drawbacks. It will be somewhat less attractive to A45 traffic than the Madingley village line (*solid red*), and definitely less attractive to A604 southbound traffic, which would have to run through an extra mile of built-up area before turning on to the bypass. It would divide the University Farm, use some of its best land and interrupt its crop records and those of the National Institute of Agricultural Botany. Finally it would emerge on the Madingley Road nearly opposite the site where the nuclear physics buildings of the University are going to be. The Madingley Road is a cherished rural approach to Cambridge which the Colleges and University and other bodies have made great efforts to preserve. The proposed University buildings have arrived there as the best practicable means of reclaiming a wartime factory site, and we suggest in paragraph 58 that traffic to these buildings should be provided for otherwise than along the Madingley Road. An entrance to a bypass almost opposite the proposed buildings would pave the way for the breaking up of the green wedge of the Farm.

Madingley village line recommended

37 If it were necessary for the northern bypass to be a continuation of a western one, this would fix the junction of the bypass with Madingley Road. But we share the view that a need for a western bypass on or near the Draft Scheme line is not more than a possibility. Our reasons for this are given in paragraph 45 below, and if it is accepted by the Committee the question of the best line for the northern bypass between Madingley and Huntingdon Roads seems to come down to one of the cost of about $\frac{3}{4}$ mile of extra road *versus* the drawbacks listed in paragraph 36. Development in the Girton area and between the Huntingdon and Histon Roads cannot be properly guided until the line for the northern bypass is decided, and we recommend that the Committee should try to secure a decision in favour of the Madingley village line. The construction of $\frac{3}{4}$ mile of new road which could be avoided, costing perhaps £50,000, is not to be lightly contemplated. In this case we think it would be justified.

38 Our proposals for a northern bypass may be summarised as follows: —

(i) *A bypass on the north side of Cambridge from Madingley Road to Milton Road will eventually be needed, but, in our view, such a bypass would attract too little traffic to justify its construction in the next twenty years if this is to be done at the expense of improvements nearer in.*

(ii) *We propose that from Milton Road westwards to Huntingdon Road the new bypass should follow approximately the same line as in the pre-war scheme (see Map 4). From Huntingdon Road to Madingley Road we propose a new and longer line to avoid the University Farm and the American War Cemetery.*

(iii) *We recommend that the line for the northern bypass should be agreed in the near future and the land reserved.*

ROADS IN WEST CAMBRIDGE

39 The Draft Scheme proposed a western bypass well outside the built-up area and running from the Madingley Road, at the foot of Madingley Hill, to the junction of the Royston and Shelford Roads. As a result of many objections at the 1939 Inquiry this proposal was dropped. There is very little development of the west side of Cambridge, and no commerce or industry worth mentioning. The justification for an outer bypass on that side must rest solely on its being a bypass for through traffic between the Huntingdon and Shelford Roads and the three roads between. (See Map 4.) Figures for the interchange of through traffic between these roads on Friday, October 22nd, 1948, are as follows: —

	Through vehicles (both directions) 7 a.m. to 6 p.m.
Huntingdon Road to Royston–Shelford Roads . . .	279
Madingley Road to Royston–Shelford Roads . . .	55
Huntingdon Road to Barton Road	10

Traffic on the Backs

40 280 vehicles a day is not very many—about one every three minutes. Even if the number were to double in the next twenty years it would hardy justify the construction of nearly 4 miles of new road or major reconstruction of existing by-roads. Yet this Huntingdon Road to Trumpington Road traffic cannot be ignored. It is one of the main streams of through traffic; and at present it travels by the Backs road (Queen's Road),* where it is joined by another through-traffic stream of equal size which is travelling between Milton Road and Trumpington Road (see Maps 4 and 46). In all about two-fifths of the through traffic circling round the central area runs through one of the world's most beautiful assemblies of buildings and grass and trees, and is likely to conflict increasingly with Cambridge's prime function.

* In the remainder of this report we call Queen's Road " the Backs road " as being more commonly used than its official name.

Growing conflict between traffic and University

41 As the beginning of conflicts of this kind often pass unnoted, it is worth recalling that until the early 'twenties the Backs road was the western boundary of University development. It was a quiet tree-shaded promenade along which people walked, or occasionally drove, looking eastwards to see the succession of Colleges come into sight among the trees. The Clare Memorial building carried academic buildings to the west side of the road and almost at the same time the opening of Fen Causeway brought through traffic onto the Backs. Then the University Library was built and large numbers of dons and undergraduates began to travel regularly along, or more usually across, the Backs road. In a year or two a new Arts building in Sidgwick Avenue will draw many undergraduates—this time in sudden rushes at Lecture times—across the Backs; and the nuclear research buildings will also add their quota if, as we later suggest, they are served by roads other than the Madingley Road.

West Cambridge needed as a reserve for University expansion

42 The story is thus one of a steady tendency towards a serious conflict in the next decade. The Backs, and the Backs road, cannot be restored to their pre-1923 quietness and their future seems limited in practice to one of two choices: to confine the use of the road largely to the University and sightseers, or for the road to be improved into a western bypass which is subjected to a great deal of cross-traffic. We think it inevitable that sooner or later a great many University buildings will be erected west of the Backs. We give our reasons for this view later in this report. They may be summarised here as being that Universities live long and require more and more buildings as knowledge becomes more specialised and its pursuit needs more equipment. The majority of the buildings now in contemplation by the University and Colleges may be sited east of the river, but some at least are to be built on the west, and the area between Huntingdon Road, the Backs and Barton Road is clearly the most suitable long-term reserve of land for academic purposes. It follows that the routes between west Cambridge and the central area should not be cut by through traffic running across them. If this traffic could be provided for elsewhere a great deal of the present character of the Backs could be preserved indefinitely. We have tried for these reasons to find means by which, at the end of 20 years, the Backs road could be virtually closed to through traffic. Our proposals to this end rely mainly, but not wholly, on providing more attractive routes.

Defects of the Backs road for through traffic

43 The first point to which we paid attention was that the Backs road and its continuations have drawbacks as a route for through traffic—see Maps 5 and 6 (in rear pocket). Travelling northwards from Fen Causeway the roundabout at the western end of the Causeway is rather small. There is then an awkward dog-leg turn in a narrow shopping street in order to reach the traffic lights at the Sidgwick Avenue crossing. The main stretch of the Backs follows, having the Burrell's Walk crossing as its only and minor hazard. After the junction in front of Westminster College, Huntingdon Road traffic has to thread a zig-zag course *via* Lady Margaret Road and Mount Pleasant, or Pound Hill and Shelly Row, to Histon Road corner. Through traffic on this portion of the route is often driven dangerously. Traffic bound for Milton Road has an easier route from Westminster College onwards, but has to pass an awkward bend in Northampton St. and the narrow Chesterton Lane. The Backs road and its approaches therefore present a number of obstructions to the two main streams of through traffic.

New route proposed for A10 traffic

44 For Milton Road to Trumpington Road (A10) traffic there was little difficulty in discovering a more attractive central area bypass. This was to provide a new route *via* Hawthorn Way and a new Chesterton Bridge to the Newmarket Road–East Road junction, and thence round the "inner ring" to Trumpington Road. The new portion of this route is an improvement to which we give first priority. We recommend that directly it is completed the route should be taken over as a Trunk Road (A10) in substitution for the proposal to schedule the Backs road as a Trunk Road. The popularity of a road is never certain until proved by traffic counts, but this seems to us to have excellent prospects. It not only is half a mile shorter than the present route but must seem so to traffic using it. This new route is described in paragraphs 62–70.

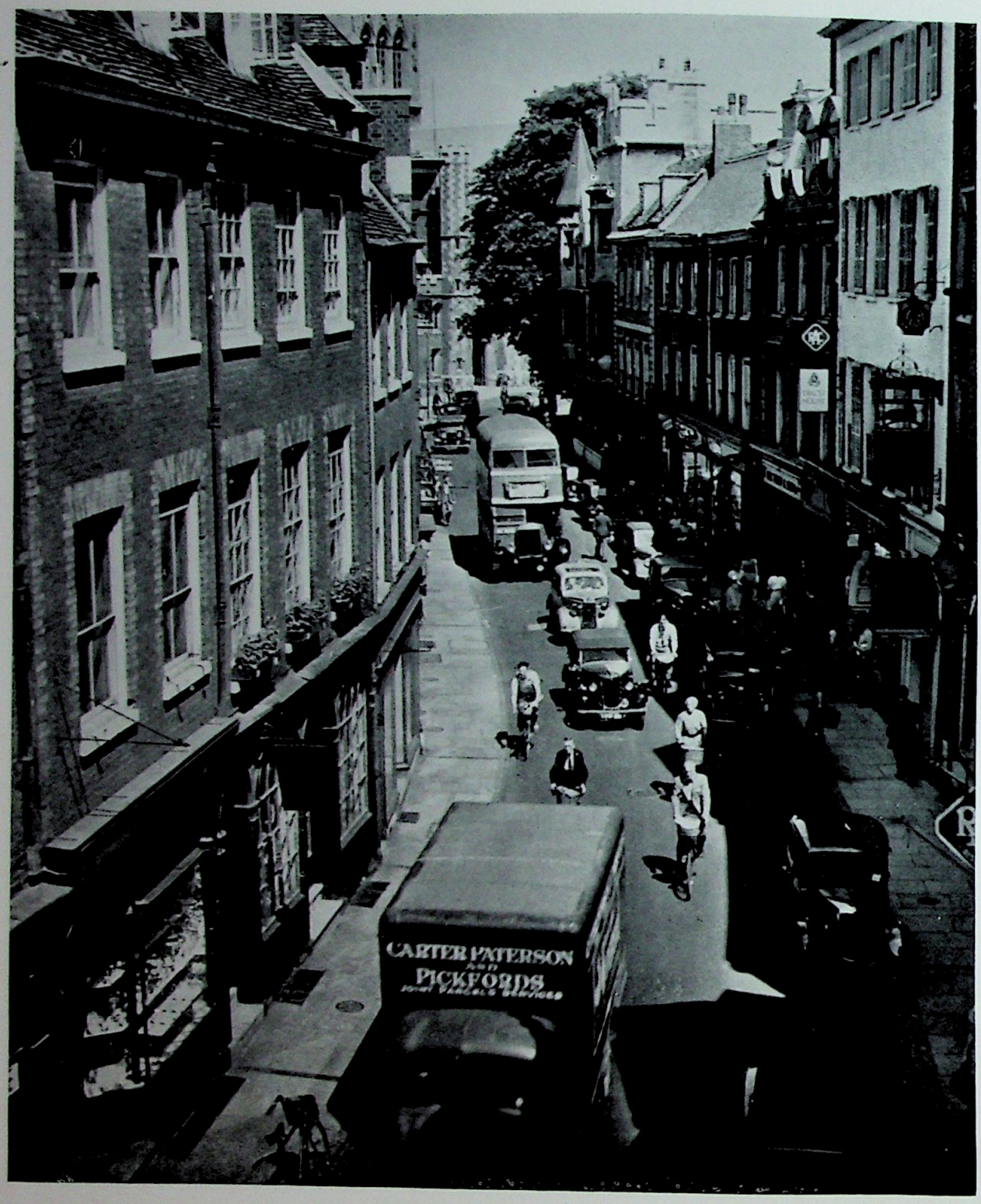
Bypass for Huntingdon Road traffic now using the Backs road

45 There remained the Huntingdon Road portion of the through traffic now using the Backs road. We agree with the view taken at the 1939 Inquiry in so far that we think a bypass far out to the west would not be justified for a long time if it is to be regarded as a substitute for the western boundary route described below. A loop road from, say, the railway bridge on the Royston Road south of Trumpington to our proposed junction of the northern ring with the Madingley Road (see Map 4) would be $4\frac{3}{4}$ miles long and would cost about £250,000. It would be totally dependent on through traffic and some of this traffic might be unwilling to make so wide a swing to the west. Even if Huntingdon to Royston and Shelford through traffic doubled in volume and all vehicles used the new road, the road would still cost half-a-crown for every vehicle using it in the first ten years of its life. If a new outer bypass were made to connect with the shorter Huntingdon Road–Madingley Road link (that through the middle of the University Farm) its cost would of course be less, but still in our view too high in proportion to the traffic it would carry.

Search for an alternative route

46 Having come to this decision we looked for an alternative route which would draw through traffic off the Backs and be much cheaper, both absolutely and in pro-

THE BACKS, SUMMER AND WINTER.
Top : the Backs road looking towards King's and Clare.
Below : St. John's New Court from Trinity Bridge.



TRAFFIC IN THE CENTRE.

Left : one-way traffic in Trinity Street. *Below :* left, Petty Cury ; right, cycles in Market Street.

portion to the traffic it would carry, than the pre-war proposals. The general layout of west Cambridge at present comprises (see Map 5) the broad Barton Road, the fairly broad Madingley and Backs roads, the rather narrow Grange Road, and various short branch roads running out west of Grange Road and arriving nowhere in particular. Beyond the line of Wilberforce Road there was before the war the open countryside. This nearness of the countryside was prized, and the Coton footpath and Madingley and Barton Roads were much used by walkers.

47 The situation has been changed by the erection of the wartime factory on the Madingley Road and by the University subsequently taking over the land and buildings for nuclear physics and associated subjects. To begin with, little traffic is expected to and from these buildings, but it would be unwise at present to say that any research centre for this purpose will not grow rapidly in size and in the number of those who travel to and from it. Before the recent war ribbon development began to push out along the Madingley and Barton roads and was halted with difficulty, and there seemed to us some danger that the presence there of the nuclear research buildings, which has arisen from the wartime use of the site for an aircraft factory, might be used as grounds for a general advance of development westwards before there was any real necessity for it; and that the view of Cambridge from Madingley Hill and the fine views outward from the town might be harmed or lost.

Proposed New West Road

48 The best course, therefore, seemed to be to treat the buildings for nuclear research as an exception and to seek some line nearer in as a suitable western boundary for other development for many years to come—a line that would allow a rounding-off of development, and the connecting up of the short lengths of road west of Grange Road. The connecting up implied a road running along or near the proposed boundary, and from this idea was developed the proposed new road (see Map 5), which is called in this report the New West Road, between the Barton and Madingley Roads.

49 The possibility of using the New West Road as a by-pass for through traffic was then examined. Barton Road was very suitable for use as the lower part of a loop round west Cambridge. Except at one point it is broad (60–75 feet wide between fence lines) and from the University Hockey Ground to the Stone Bridge on the Barton Road has no noticeable bends. There remained two further problems: to connect Madingley Road with Huntingdon Road along a line continuous with New West Road; and to attract northbound through traffic along Trumpington Road onto Barton Road.

Madingley Road to Huntingdon Road: Observatory Road

50 The first problem can in our view be solved easily enough, in either of two ways. The northern end of New West Road, near Vicars Farm, can be connected to the upper part of Storey's Way (see Maps 5 and 6) by a new road only 500 yards long, which need not disturb anything except some of the fowl runs of the National Poultry Institute, although it would be better if one house was bought and demolished. The other route, more costly but in our view better, runs from Madingley Road northwards close to the eastern boundary of the Observatory, and then along the north-west side of St. Giles and St. Peter's Cemetery to join Huntingdon Road. This route (which for purposes of this report we call Observatory Road) would be 900 yards iong (see Map 5) and would disturb both the folds of the Poultry Institute and the land of the Botany Field Station. It would also require the demolition of one house on Huntingdon Road. But if a link is needed between Madingley and Huntingdon Roads it is doubtful if a better line could be found. Placed close to the Observatory boundary (but on the whole not much nearer the instrument houses than is the Madingley Road) it would hardly be seen from the Madingley Road, especially if trees are planted along its east side. All it demands from the Farm is a strip of about 25 by 400 yards on its extreme eastern boundary. The houses on the north-west side of Storey's Way are separated from it by the width of the Cemetery and the length of their back gardens—say by 350 feet on the average. No one would wish to construct Observatory Road if it were to be merely a local link, but if there is agreement that its construction is necessary to draw the through traffic off the Backs, and that it would do so, then there seems a very great deal to be said in its favour.

Fen Causeway a defect in the new route

51 The second problem was to attract onto Barton Road through traffic moving between the Royston–Shelford Roads and Huntingdon Road. It would be very difficult to do so if this traffic is to follow its present route (Trumpington Road and Fen Causeway) as far as the western end of Fen Causeway. In spite of the defects in the present route through traffic bound for Huntingdon Road would probably dislike having to turn right away from its desired direction for the 250 yards between the Fen Causeway and the Grantchester St.–Barton Road corner. (See Maps 5 and 6.) Severe restrictions on traffic along the Backs might overcome this reluctance and we suggest in paragraphs 56–57 that restrictions should in time be imposed. Restriction, however, has most chances of success, because most justifiable, when convenient alternative routes have been provided. Only in most rare cases can one hope to be able to use it to dam an established route for which there is no reasonably convenient alternative; and in spite of the fame of the Backs road we doubt whether through traffic could be taken off it until the backward turn from Fen Causeway to Barton Road is got rid of.

52 We tried to use Fen Causeway as part of the new boundary route and examined ways in which Fen Causeway might be extended westward, either to curve southwards back to Barton Road or to continue parallel to

Barton Road to join the New West Road (see Map 6). We came to the conclusion that the first of these was, on the whole, not worth while and that the cards were stacked too heavily against the second. Reluctantly we then looked for a river crossing other than Fen Causeway.

Chaucer Road Bridge

53 Various crossings from Grantchester–Trumpington inwards have been considered and the best is in our view that offered by a continuation of Chaucer Road westwards across the river to meet Barton Road at its junction with Grantchester St.* The route avoids cutting across the more open reaches of the upper river and the new portion of it would be less than 700 yards long (see Maps 5 and 6). Chaucer Road is a public road 50 feet wide between fences. Some of the large houses are already in use as offices, and in view of its proximity to the Government Regional Centre it is unlikely to become again a quiet road of single-family houses.

54 The main aim of the Chaucer Road crossing (and the western boundary route as a whole) is to divert through traffic from the Backs road. For traffic approaching along the Trumpington Road, Chaucer Road is inclined in the right direction. The new route to Huntingdon Road would be 5,000 yards long, as against 4,600 yards by the present route; but it would be less obstructed and allow traffic to avoid six or seven awkward corners. Southbound traffic would have to make a right-angle turn out of Huntingdon Road and might be more reluctant to use the new route until the speed limit, which we later suggest, is imposed on the Backs road. In conjunction with other measures we believe the western boundary route is the best practicable solution to the problem of through traffic on the Backs road.

55 The new route would also attract other traffic (see Map 6). It would attract traffic from the railway station to west Cambridge and also traffic from Hills Road and Cherry Hinton Road travelling to the north-west and parts of west Cambridge. Fen Causeway would continue to be an important link between west Cambridge and the rest of the town, being at the end of the partly new route running in an arc round the central area to Chesterton Bridge and Milton Road.

Restricting traffic along the Backs

56 We have stated earlier that we think restriction of the amount or kind of traffic that uses the Backs road would have to await provision of more convenient or equally convenient alternative routes. If, however, A10 traffic is re-routed *via* East Road and the new Chesterton Bridge, and a western boundary route is constructed on the line just described, it would be reasonable to take steps to ensure that the Backs road does not continue thereafter to carry fast traffic or a large amount of traffic.

57 A number of measures may be used, singly or in combination, to bring about this result. As a first step we recommend that an origin and destination census should be taken of traffic on the Backs road as it is at present,* and that this should be repeated after the completion of each road improvement which is likely to affect traffic on the road. Secondly, a speed limit of 20 or even 15 m.p.h. might be imposed, and the special character of the road emphasised by some form of double carriageway entrance at either end, as is done in the Royal Parks in London. A direct route between Histon Road corner and the north end of the Backs road would undoubtedly encourage local traffic to use the Backs as a central area bypass. Elsewhere we propose (paragraphs 96–119) a central area bypass on the east—the side where most traffic wants to be—and therefore we recommend that no encouragement be given to traffic moving between Histon Road corner and the Backs in redeveloping the obsolescent area between the corner and Northampton St.

Coton footpath to the Backs

58 Paragraphs 39–57 have described our main proposals for roads in west Cambridge and the reasons for them. In conclusion two other proposals should be briefly mentioned. We hope that it will be possible in time to provide access to the nuclear research buildings from the south rather than from Madingley Road, and we therefore propose a road running parallel with Coton footpath and eventually linking up with Adam's Road, Burrell's Walk and Garret Hostel Lane. We do not intend that a carriageway should be constructed on this road farther east than Grange Road, but the whole route from the Backs westwards should be carefully improved so that, while carrying more traffic (especially pedestrians and cyclists) than it has in the past, it will be one of the pleasantest routes from Cambridge to the countryside. This proposal is linked with our hope that the University will not find it necessary to plan their research buildings within the L-shaped site of the former factory, but will in time be able to group them on the north of the Coton footpath in an oblong presenting its short side to an observer on Madingley Hill.

Sidgwick Avenue

59 The second proposal is for improvements in the neighbourhood of Sidgwick Avenue. When the new Arts Building and the nuclear research buildings are completed, Sidgwick Avenue will be called on to carry additional traffic. This will comprise motor traffic (not at first very much) between Downing St. and the research buildings, and a large amount of cycle traffic between the Arts Building and the Colleges. There will also be an increase in general traffic as building takes place on undeveloped land east of the New West Road. We recommend that Sidgwick Avenue should be widened in time on the north

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* Like our Chesterton Bridge proposal this crossing has been previously proposed. See paragraph 20 *ante*.

* There have been indications that traffic on the Backs road has increased since the counts in June–October, 1948.

side by a footpath or additional carriageway behind the trees, and that improvements should be made to the junctions at both ends of the Avenue. Sidgwick Avenue is not well suited for being the main internal traffic route of west Cambridge, but this seems unavoidable. It is in line with Silver St. bridge and an attempt to turn traffic on to an alternative route—Burrell's Walk or West Road would increase traffic on the Backs (see Maps 5 and 6). A connection between the new Arts Building and West Road, which is intended, will in time relieve Sidgwick Avenue of a good deal of cycle traffic to the Arts Building.

60 Our proposals for main road improvements in west Cambridge may, therefore, be summarised as follows:—

(i) *During the 20 years 1950–70 a western boundary route should be constructed from the Huntingdon Road (just north of Storey's Way) to the Chaucer Road–Trumpington Road junction.*

(ii) *The two main new portions of this route should be constructed in the second stage of our programme (1956–62). These portions are the New West Road from Vicar's Farm on Madingley Road to the Stone Bridge on Barton Road; and Observatory Road between Huntingdon and Madingley Roads just east of the Observatory. Together these would be about 1½ miles long and we have allocated £80,000 towards their cost, including improvements to junctions.*

(iii) *A new road and bridge between Barton Road and Trumpington Road* via *Chaucer Road should be constructed early in the third stage (1963–69). The new portion of this route would be 700 yards long and we have allocated £100,000 towards its cost, including the bridge and improvements to the Trumpington Road and Barton Road junctions.*

(iv) *A limitation of speed to 15 or 20 m.p.h. should be imposed upon traffic along the Backs road and the special character of the road should be marked at either end by a double carriageway entrance or in some other suitable way. The best time for introducing these changes should be ascertained by periodic origin and destination censuses, but would probably be on completion of the Chaucer Road and Barton Road link. The proposed entrances to the Backs road would be simple and we have allocated £5,000 towards their cost.*

(v) *We recommend construction of a new roadway from the nuclear research site to Adam's Road; and improvement, including landscaping, of the route from the research site to the Backs road; the work to be equally divided between the first and second stages. The cost of the new development road should not be reckoned as an improvement to main traffic routes, but we have allowed for a contribution of £10,000 to the cost of the whole work.*

(vi) *Widening of Sidgwick Avenue and improvements to the Sidgwick Avenue and Backs junction, during the first and second stages. A proportion of the work should be regarded as part of the development of the Arts Building site, but we have included a contribution of £15,000 towards the cost.*

IMPROVEMENTS IN EAST CAMBRIDGE

I. MILTON ROAD TO NEWMARKET ROAD

Need for new road crossings on the east

61 Study of the plan of Cambridge and of the results of the traffic survey (Maps 4 and 58) shows that Cambridge badly needs further river crossings on the east side. On the south side of the river housing and industrial development now extends almost 2 miles east of Victoria Avenue (the most easterly crossing) and on the north side the eastward spread is not much less. When the Arbury Road housing scheme is completed a further 3,000–5,000 people will be added to the population north of the river, and in default of new crossings many of these will use Victoria Avenue for their journeys to the centre.

Chesterton Bridge preferable to the eastern bypass

62 It therefore seemed to us that of all the improvements which could be carried out in east Cambridge within a reasonable period the one most needed was a new river crossing. The choice lay, in our view, between completion of the eastern bypass from Newmarket Road to Milton Road, and, secondly, the Chesterton Bridge crossing between Cam Road and East Road. We have mentioned in paragraph 29 that we decided in favour of Chesterton Bridge. This was an important decision and we had three main reasons for it.

63 The bypass crossing would cost, we believe, not less than £300,000. This takes no account of the cost of completing the link between Coldham's Lane and Newmarket Road which would be needed to make the road a bypass for through traffic. The Chesterton Bridge route would require one river bridge and about 700 yards of new road (including the Chesterton Road to Milton Road link). Even making generous allowance for greater disturbance and compensation called for by the Chesterton Bridge crossing the test of cost favours it greatly. The second reason for preferring the Chesterton Bridge route was that the eastern bypass would not, to begin with, carry much local traffic. The Chesterton route would, however, connect directly with East Road, and thus with an important local traffic route which runs almost in a straight line right through to Fen Causeway (see Map 6). It would thus at once become a heavily used local traffic route.

64 The third and most weighty reason was that the difficulties in the way of a satisfactory link between New-

market Road and Milton Road, on or near the line proposed before the war, seemed to grow greater with study. Nearly half a mile of bridge and viaduct would be needed, plus a quarter mile of ramps; and to feed the route into the obstructed Cam Causeway would diminish its efficiency, especially for trunk traffic. Because, despite all its disadvantages, no better route is now likely to be practicable, we believe that if Cambridge grows this crossing will have to be made. But we do not believe it will be made for a long time.

Approaches to Chesterton Bridge

65 Both the approaches to the Chesterton crossing and the details of its route have been carefully studied. As regards the northern approaches we realised that it might be objected that Hawthorn Way, Haig Road and Cam Road (see Maps 6 and 7) are quiet residential roads and unsuitable for use as part of a Trunk Road. Our answer to this is that Hawthorn Way could be widened to 58–60 feet between fences without seriously injuring the amenities of the houses (which would still have a garden strip in front 8–9 feet wide); and that Haig Road and Cam Road could be widened to 50 feet between fences and still leave the houses with a 4–5-foot garden strip, although this would require destruction of the trees in Cam Road. These widths are not ideal, and it is not in accordance with modern ideas to allow houses direct access to a Trunk Road. But we think the advantages of the route outweigh its drawbacks, especially as the widths we have mentioned and general suitability of the road could be improved by the use of unconventional methods. Side roads could be stopped off at their intersection with the Bridge approach and the long gardens behind the houses on the west side of the road could be used to provide rear access. It would be quite possible, though a little more difficult, to do the same on the east side of the route. (See Map 7.) In short, we believe that the approach to the Chesterton Bridge from Milton Road could be made into a reasonably good traffic route at a moderate cost—the more moderate in that the Borough own nearly half the land that would be needed for new portions of the route.

66 At the southern end of the Bridge the main question was whether East Road could carry a large increase of traffic. East Road runs through the middle of the largest area of poor-to-bad quality buildings in Cambridge—one which will have to be comprehensively redeveloped in the comparatively near future. We therefore gave some thought to East Road as a traffic artery in relation to this redevelopment. We decided that it was inevitable that East Road should continue to be an important local traffic route and that it could be improved to carry both local and arterial traffic by the measures described in paragraph 72 below.

Chesterton Bridge

67 Having established that a bridge on the general line from Cam Road to the East Road–Newmarket Road junction would not be starved of traffic by inadequate approaches, attention was given to the best route and the best kind of bridge. A number of different solutions were tried which need not be described here. Map 7 shows our final proposal. This comprises a 40-ft. carriageway and two 6-ft. footways. The approach ramps would have a 1-in-30 gradient and the bridge would give 14 ft. headroom above the normal water level. This is the headroom at Victoria Bridge and any reduction of it would of course lower the cost of the bridge. The ramped approaches to the bridge are curved on plan, but the horizontal sight line of 500 ft. is only 20 ft. less than the vertical sight line. The horizontal curve could be flattened by bringing the southern ramp nearer the houses on the east side of Walnut Tree Avenue. The line shown on Map 7 keeps the ramp 25 feet away, on the average, from the houses and thus cuts down disturbance to them and retains vehicular access to nearly all of them. It seemed to us that if the Chesterton Bridge was to be constructed, as we hope, in the first stage (1951–55) disturbance to houses should be avoided as much as possible. It will be seen that the line proposed between Chesterton Road and Newmarket Road calls for the demolition of only two houses, and the only major disturbance is to Messrs. Banham's dock and workshops. It is possible that this disturbance could be offset in some degree by storage made available under the new roadway. The construction of the Bridge and ramps would also require the taking over of about one-fifth of an acre of Midsummer Common.

The Milton Road–Chesterton Road Link

68 A new route between Newmarket Road and Chesterton Road would be greatly used by local traffic and would also draw onto it a good deal of Milton Road traffic *via* Hawthorn Way or Union Lane. But neither of these roads is suitable as part of a Trunk road, and the extension of Haig Road straight through to the upper part of Hawthorn Way and thus to the Milton Road (see Map 6) is so simple an undertaking that we feel it should be done at the same time as the construction of the Bridge. The new road would run through the grounds of Chesterton Hall, already owned by the Borough, and would be 220 yards long. Considering its importance it would be an easy and cheap link to construct—the only drawback, at present no trifling one, is that it would require the demolition of three houses in Hawthorn Way which were built 24 years ago. We regret having to propose the demolition of these houses and realise that it may be very difficult to demolish them before 1955. But however much one may regret having to propose the demolition of any house that is not in very bad condition, we think the proposal must be seen in proper perspective. The route from Milton Road to East Road is nearly a mile inside the built-up area of the town and will be a major traffic route. That so big an improvement (after a delay of 70 years or so since it was first proposed) should require the demolition of only five small houses must be considered fortunate. The demolition and replacement of the five houses (three in Hawthorn Way and two in Cam Road) should not cost more than £10,000 at present prices.

New roundabout at the East Road–Newmarket Road junction

69 When the route is completed the junction between Newmarket Road, East Road and the approach, *via* Walnut Tree Avenue, to Chesterton Bridge would have to deal with heavy traffic. Improvement of the junction for this purpose is proposed in two stages; illustrated in Map 7. The age and condition survey of buildings, carried out by the County Planning Department, places buildings in five classes, and the first stage of improvement to the roundabout could be executed by the removal of some half-dozen very poor buildings in class 5, a small cottage in class 4 and a shop in class 2. The crossing would then be partly a roundabout and partly controlled by lights. The lights would be vehicle-operated and linked in a suitable manner. In the second stage a roundabout could be formed which would retain some of the existing trees and set up new building lines around the junction. The roundabout would be large enough to deal with any traffic likely to use it, but it would have to be formed as part of the redevelopment of the surrounding land in order to ensure rear access for vehicles to buildings fronting on it.

Summary: Milton Road to East Road

70 Our recommendations for a new route between Milton Road and East Road may be summarised as follows: —

(i) *A new route should be formed between Milton Road and East Road during the first stage of our proposals* (1951–55). *When completed the new route should be made part of Trunk Road* A10.

(ii) *The route would comprise a new river bridge (the Chesterton Bridge), about 700 yards of new road, and improvements to existing roads. We have allocated* £100,000 *towards the cost of the new route including the bridge.*

(iii) *The junction between Newmarket Road and East Road should be improved in two stages before* 1970. *This improvement should be part of the comprehensive redevelopment of the East Road Area under the* 1947 *Act, but we have allowed for a traffic improvement contribution, towards the cost of the new junction, of* £20,000.

2. THE EAST ROAD AREA

Need for comprehensive redevelopment

71 The area between Emmanuel Road and the railway, and Newmarket Road and the Park Side–Mill Road line, contains about 250 acres, and it is very well placed as regards communications. It is densely built and untidy, and contains a high proportion of small and nearly derelict buildings. Although one of the most thickly populated parts of Cambridge, it contains over a hundred commercial and industrial undertakings, most of them small, and many of them in obsolescent buildings. There can be no doubt that most of the district will require to be comprehensively redeveloped under the powers of the 1947 Act, and little doubt in our view that such a redevelopment would pay in every sense. The proposed redevelopment of a portion of the area is illustrated on Map 27. Three improvements to main traffic routes are needed in the East Road area: improvement of East Road itself to carry trunk traffic; development of a new route from Newmarket Road to the Railway Station; and improvements to Mill Road.

Widening East Road

72 In paragraph 66 we recommended that East Road should be improved and made part of Trunk Road A10. There are some shops fronting on the road, but most people in the western and northern portions of the district do their local shopping in Fitzroy St. and Burleigh St., and those in the south-western portion shop in and near Mill Road. We therefore recommend the removal of the shops from East Road, that it should be widened (especially at its northern end) and that access to it should be restricted. At present the road varies between 48 and 26 feet in width between building lines, but the narrower sections could be widened in the first stage (1951–55) or soon afterwards. We propose a 40-foot carriageway, with restrictions on waiting except where additional waiting bays are provided.

Occupation Road and Sturton Street to Mill Road

73 All traffic between north-east Cambridge and the Railway Station is likely to use Chesterton Bridge directly it is opened. This is one reason for providing a fairly direct and broad route between Chesterton Bridge and the Station as part of the redevelopment of the East Road district. An examination of Map 6 provides another reason. If the proposals for west Cambridge (paragraphs 39–60) and for the neighbourhood of the Station (paragraph 80) are carried out, an intermediate route would come into existence extending in an arc from the New West Road, *via* Barton Road, Chaucer Road and Brooklands Avenue, to the Station. The continuation of this intermediate route to Chesterton Bridge would encourage a good proportion of northbound traffic (from the Trumpington, Hills and Cherry Hinton Roads) to proceed to its destination by turning right or left onto this route. This would relieve the present " inner ring " along Lensfield Road, Gonville Place, etc. A third reason is that many industrial establishments (including Messrs. Pye's and Marshall's) lie near, or east of, the Chesterton Bridge crossing, and all of these would benefit from an improved route to the Station. We therefore propose an improved and partly new route, with a carriageway at least 30 feet wide, *via* Occupation Road and Sturton St. and thence between Gwydir St. and Kingston St. to a new roundabout on Mill Road (see Map 6). This route should be brought into existence as occasion serves, and could probably be largely completed before 1970.

Factory Sites and owner-occupied dwellings

74 Progress on the construction of this route, as also on the widening of East Road, will be dependent on the pace of general redevelopment in the East Road district, and two matters that will greatly influence this pace may be conveniently mentioned here. The first is the provision of a suitable area or areas of land (3 to 8 acres in all) for the erection of small industrial buildings. At present consent to development applications for small industrial buildings cannot reasonably be withheld however inimical they may be to proper redevelopment of the area, because the County Planning Department cannot suggest suitable alternative sites. The second factor is the increase in owner-occupation of small houses in the district. Many of these houses are of poor quality and the Borough will no doubt take account of the need for general redevelopment when considering whether to make loans for improvement of individual houses under powers granted by the new Housing Act. Nevertheless extensive owner-occupation by people of small income must inevitably complicate the redevelopment programme. Both in our road proposals and in our redevelopment plan for the East Road district we have tried to allow for these two factors. For example, the new road proposed between Occupation Road and Mill Road has been taken through the back gardens between Gwydir St. and Sturton and Kingston Sts. so as to allow demolition of houses in these streets to be postponed for the full period of useful life remaining to them.

Mill Road

75 Improvement of Mill Road, which is badly needed, belongs to the most difficult class of civic improvements. The road is straight and narrow, carries a heavy traffic which we see no practicable means of diverting, and has a busy shopping centre established along most of its length. Sixteen side roads enter in a length of not much more than half a mile and the Mill Road railway bridge is narrow. It follows, almost inevitably, that more accidents occur in Mill Road than anywhere else in Cambridge except right in the centre. The road's many defects can only be remedied as redevelopment of adjacent land takes place, and proposals for redevelopment adjoining a portion of the road will be contained in the plan for the East Road district. We suggest that properties along the north side of Mill Road should be acquired with the intention of setting them back and forming service roads on one or both sides of the principal carriageway. Subsequent redevelopment should aim at forming a roundabout at St. Barnabas Road, cutting down the number of side roads entering Mill Road and widening the railway bridge. The widening of this bridge is referred to again in paragraphs 86–87.

Summary of proposals for the East Road Area

76 Our proposals for road improvements for the area from the East Road–Newmarket Road junction southwards to Mill Road may be summarised as follows: —

(i) *East Road should be improved to carry both Trunk traffic and local traffic. In the first stage* (1951–55) *it should be widened at the northern end, and redevelopment should be substantially complete by* 1970. *We have allowed for a a traffic improvement contribution of* £100,000 *towards the cost of the redevelopment, of which* £50,000 *would be expended in the first stage.*

(ii) *A partly new route should be constructed between Newmarket Road and Mill Road* via *Occupation Road, Sturton St. and thence between Gwydir St. and Kingston St. to Mill Road, where a roundabout should be formed. If this were a traffic improvement alone we should not recommend its inclusion within our 20-year programme of works, but at least one-half of it is likely to be completed within that period as part of redevelopment of adjoining land. We have allowed for a traffic improvement contribution of* £50,000 *towards the cost of this work.*

(iii) *Mill Road should be radically improved, as part of the redevelopment of adjoining land, from St. Peter's Field to Coleridge Road. In view, however, of other claims we do not think that much more than one-third of the work is likely to be completed before* 1970, *and we allocate* £50,000 *as a road improvement contribution to this part of the work* (*exclusive of the cost of rebuilding the railway bridge*).

3. IMPROVEMENTS NEAR THE RAILWAY STATION

77 Cambridge Railway Station has remained unchanged for a very long time and has become something of a national institution. Even its faults do not seem of quite the same species as those of other stations. From the public's point of view, the Station's most conspicuous fault is its poor access, which causes a great deal of inconvenience, and we think the Development Plan should provide for improvement.

Access to the Station from the East

78 The Station's greatest drawback is that passengers can approach it only from Station Road, and for the great majority of passengers this means traversing the whole length of Station Road. Passengers coming from the south and south-west have thus to make a roundabout approach over Hills Road railway bridge. The number of people inconvenienced in this way is likely to grow considerably during the next few years. The Borough is to build two housing estates east of the Station—one between Rustat and Coleridge Roads, adjoining the Station, and another off Queen Edith's Way near Cherry Hinton Road (see Map 33). It is also likely that a large proportion of houses built by private enterprise in the next few years will be built near Queen Edith's Way. We

therefore propose, as a first improvement, the provision of access to the Station from the east by means of a footbridge or subway, together with a small car park and a bicycle store. (See Map 8.) We have discussed this proposal with the appropriate railway authority and they see no great difficulty in providing this improvement before 1955.

Improvements to the forecourt

79 Our second proposal is for the enlargement and improvement of the forecourt. (See Map 8.) Ideally an improvement of this kind should be linked with a rebuilding and even re-laying out of the Station, but we accept British Railways' statement that other and more urgent works to which they are committed makes it impossible for them to promise any major reconstruction of Cambridge Station during the next 20 years. We have, therefore, assumed that the Station buildings will remain substantially unaltered, but that it will be possible to remove the buildings between the Flour Mills and the engine shed so as to form a forecourt measuring about 320 by 260 feet. These buildings are of temporary construction or of poor quality. The scheme shown in Map 8 would provide largely separate circulations for cars, buses and cycles, a new cycle store, and protection from the weather over a portion of the forecourt. Parking space for 120 cars and 35 taxis would also be provided, together with some small planted areas. First impressions of a town are apt to be lasting and Cambridge has many visitors. We therefore think the improvements shown in Map 8 reasonable and overdue, and recommend their execution before 1970.

Hills Road–Tenison Road link

80 The completion of the intermediate route around the central area from the East Road–Newmarket Road junction to Fen Causeway (see Map 6) will require the construction of a new link between Brooklands Avenue and Tenison Road, which would lead *via* St. Barnabas Road to the new road between Gwydir St. and Kingston St. This link would require the demolition of a large house in Station Road and a coal order office and part of a railway garage in Hills Road. It would run through Messrs. Austin Beales coal yard and a small railway goods yard, and would sever rail connections to the upper portion of the yard.

81 Our proposals for improvements near the Railway Station may be summarised as follows: —

(i) *The provision of footbridge or subway access to the Station from the east in the first stage* (1951–55) *together with a small car park and cycle store. We allocate* £10,000 *towards the cost of this improvement, which we regard as one in which British Railways should take a large share.*

(ii) *The formation and laying out during the second and third stages* (1956–69) *of a new Station forecourt, towards which we have allocated* £50,000.

(iii) *Construction of a road between Brooklands Avenue and Tenison Road and improvements of the junctions with Hills Road and Station Road during the third stage* (1963–69), *towards which we have allocated* £35,000.

4. OTHER IMPROVEMENTS IN EAST AND SOUTH-EAST CAMBRIDGE

82 We consider that improvements will be needed at certain other points to the east and south-east of the central area. These include two road junctions and two bridges over railways.

Four Lamps

83 The Four Lamps roundabout at the junction of Maids Causeway and Victoria Avenue is too small. At best vehicles follow round rather than weave and when any large volume of cross-traffic is passing the roundabout tends to jam. We propose that the roundabout should be enlarged as shown in Map 9. The main reason for the closing of the east end of King St. is to form a roundabout capable of dealing with heavy traffic. King St. is, however, narrow and must remain narrow if sites for shops of reasonable size are to be provided on either side. We believe that if the street is served by the spine relief road in its centre, and by Belmont Place towards its east end, the closing of its present eastern entrance will not injure its trade. In fact we hope that King St. will have in future a larger share in central area trade than at present.

Mitcham's Corner

84 Although £5,000 was spent comparatively recently on forming the roundabout at Mitcham's Corner the junction still has serious faults. All five roads converging on it carry heavy traffic, and one of them—Victoria Avenue—carries the heaviest motor traffic on any street in Cambridge. Traffic circulation is confused by the T junction between Chesterton Road and Victoria Avenue, which, while very close to the roundabout, does not form part of it; and congestion at this point is made worse by the fact that Victoria Road corner and the approach to Victoria Bridge has become a prosperous and growing shopping centre. This growth of shops, itself largely a result of the traffic concentration, means that the approach to the bridge is usually obstructed by standing vehicles. In addition, the ramp to the bridge is steep and there is a sharp turn on the south side of it. The present roundabout has inadequate weaving lengths at its east and west ends, where traffic is exposed to right-angle cross-cuts. The junction ranks fifth in Cambridge in order of number of accidents which take place there.

85 The provision of lights at the entrance to the bridge approach and a ban on stationary vehicles in the approach (other than vehicles delivering goods to shops in off-peak hours) would improve matters, but we do not think any changes which could be carried out in the near future would really solve the problem. We therefore recommend that redevelopment should not be permitted in the block

of houses opposite the bridge approach, and that when the houses come near the end of their useful life the new roundabout shown in Map 10 should be constructed. It would be difficult to remove the prosperous shopping centre which has grown up around the junction and we therefore provide for goods access from the rear, or from service roads, to buildings nearby. A case could be made for the designation of the area under Section 5 (2) (c) of the 1947 Act in order to ensure that these improvements are carried out.

Hills Road, Mill Road and Newmarket Road (Barnwell) Railway Bridges

86 Hills Road and Mill Road bridges have carriageways not much more than 20 feet wide, and although the Newmarket Road bridge is wider its western ramp is sharply curved. All three are below modern standards and the first two, which carry heavy local traffic peaks, badly need widening. We have discussed this question with railway representatives with special reference to Hills Road bridge. British Railways' view, as we understand it, is that they do not like Hills Road bridge but that the greater urgency of other reconstruction and repair works would compel them to defer its rebuilding for an unspecified period. We believe, however, that the structural condition of both Hills Road and Mill Road railway bridges is causing the railways concern. For this reason we believe that both bridges will have to be rebuilt before the end of our 20-year period. We have assumed that Hills Road bridge will be rebuilt during the second stage of our programme (1956–62) and Mill Road bridge during the third stage (1963–69). We have assumed that improvements to the Newmarket Road railway bridge (Barnwell Bridge) will not be made before 1970.

87 Map 11 shows our proposals for the new Hills Road and Mill Road bridges. Each bridge would have a 40-ft. carriageway, two 10-ft. footways, a 1/30 ramp and 15 ft. 6 ins. clearance for railway vehicles. The long 1/30 ramps would require changes to the junction of Cherry Hinton Road and Hills Road, and some diversion and stopping up of local roads near the Mill Road bridge.

88 Our recommendation for improvements during the next 20 years to railway bridges and the Four Lamps and Mitcham's Corner junctions may be summarised as follows:—

(i) *The Four Lamps roundabout should be enlarged as shown in Map 9 during the third stage (1963–69). We have allocated £20,000 towards the cost of this work.*

(ii) *The Mitcham's Corner roundabout and bridge approach should be improved and redeveloped as shown on Map 10. Probably it will only be possible to carry out a small portion of this work before 1970. We allocate £10,000 towards the acquisition of property and other preliminary work.*

(iii) *We recommend that Hills Road railway bridge should be rebuilt in the second stage (1956–62) and Mill Road bridge in the third stage (1963–69) on the lines shown in Map 11. These bridges are a railway responsibility, but it is the increase of road traffic and the requirements of road traffic that will largely control the design and cost of the new structures. In allocating £50,000 towards the cost of each bridge we do not, of course, attempt to decide how the several authorities concerned should contribute to the rebuilding.*

THE CENTRAL AREA

The cramped position of the area

89 The part of Cambridge which we call the central area is shown on Map 3 in relation to the whole town and in detail on Map 12. It contains the larger part of what most non-residents think of as Cambridge. Its traffic problems deserve special attention, not because the congestion is as yet very great but because the area itself is very special. Map 12 shows one of the well-known features of Cambridge—that the central area is bounded on the west by the wonderful line of Colleges backing onto the river; it also shows, and this is less generally appreciated, that nearly all the south side and the greater portion of the east side of the area are also occupied by University and College buildings. The centre is almost fenced in by University and College buildings, and what was once a small market centre, with some extra shops and inns catering for the University, is now the central shopping and business area for the 104,000 people in Urban Cambridge and for many living farther out. The traffic problem of the centre has arisen from the greatly increased numbers of people and vehicles pushing in through cramped entrances and circulating in narrow, awkwardly aligned streets.

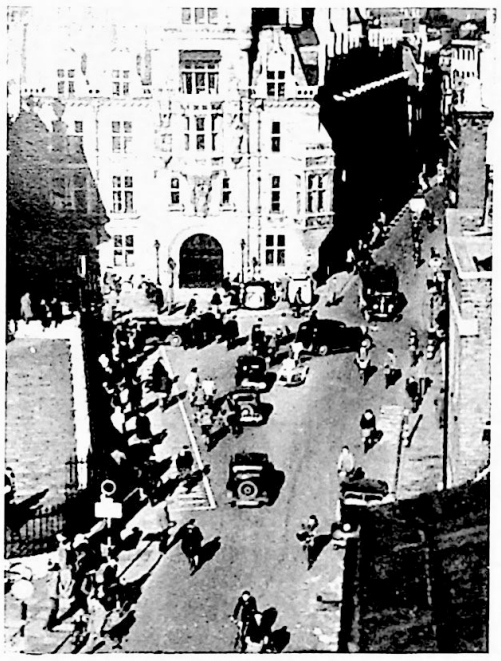
Relief afforded by improvements outside the area

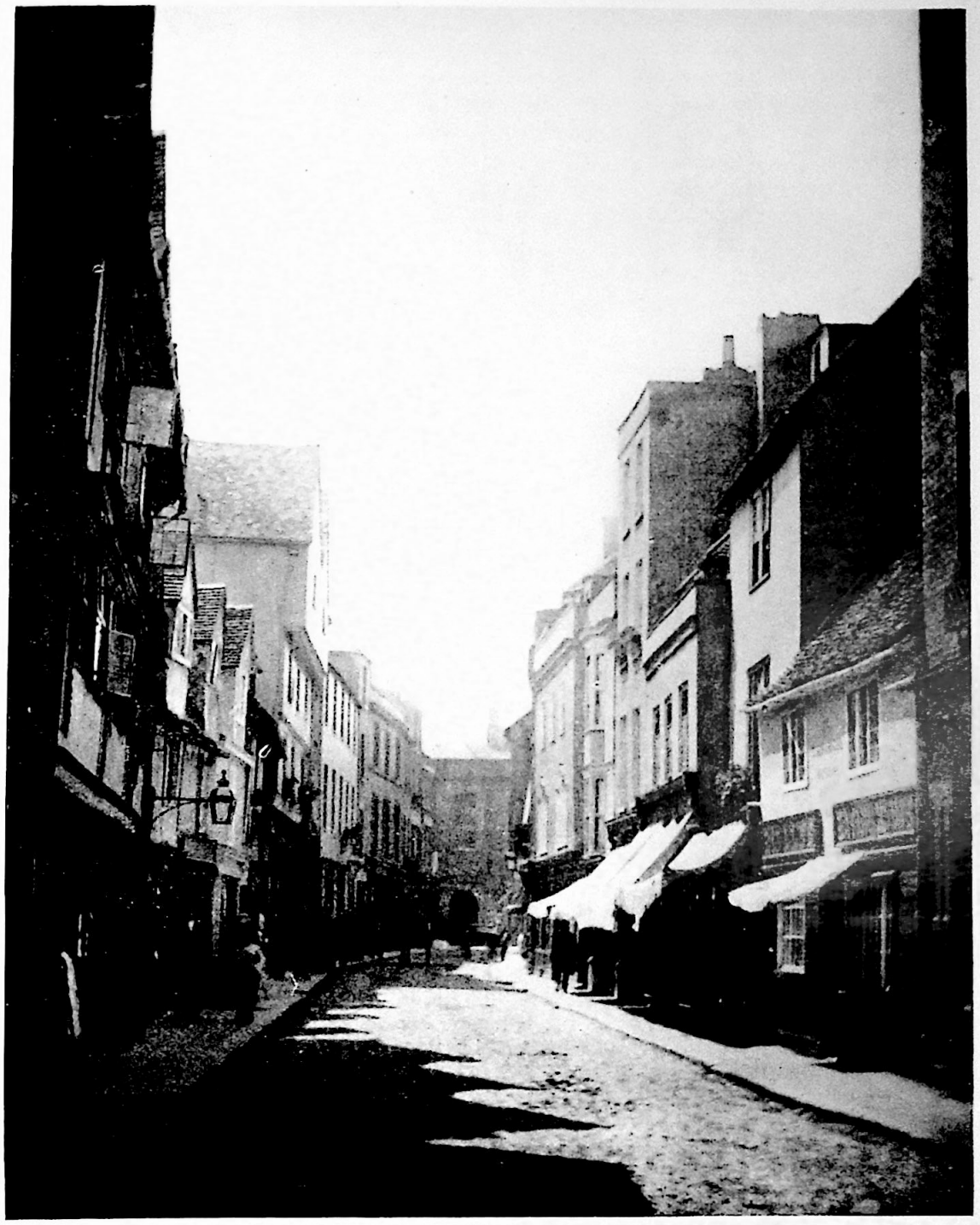
90 We believe that if the proposals described in earlier paragraphs were carried out they would do something to relieve congestion in the central area by providing direct or faster routes between parts of Cambridge which have been hitherto connected by routes passing through or near the centre. The main aims of these earlier proposals are, however, to divert through traffic and to improve the communications of the town as a whole, and we think that traffic congestion in the central area must be considered largely as a separate problem and dealt with accordingly.

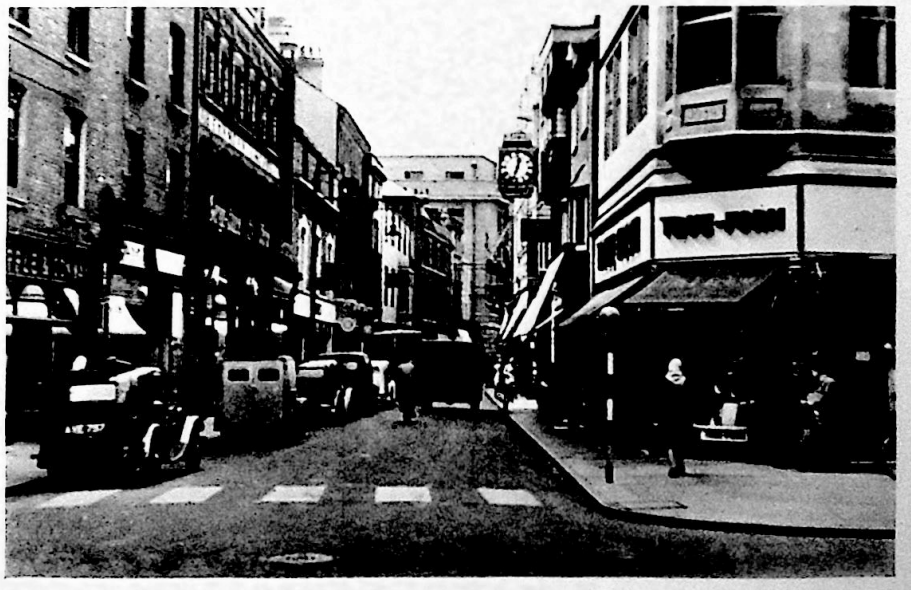
The dominant uses

91 The special qualities of the centre of Cambridge make it necessary to approach its problems differently from those of an ordinary central area. In an ordinary town

TODAY AND 75 YEARS AGO.
Right and bottom right : Petty Cury about 1880 and today. *Below :* Senate House Hill and Trinity Street, today and before 1870







TRAFFIC IN THE CENTRE.

Left : Sidney Street, at the junction with Market Street. *Below, left :* Downing Street corner from the roof of Emmanuel. *Below :* Market Street from the market place ; and bus queues outside Lloyds Bank and Christ's.

it is almost inevitable that a well-established centre should be regarded as fixed: and road proposals can be based on general agreement that somehow or other, sooner or later, adequate roads must be provided to it and in it. Surrounding land uses must in time yield to the dominant commercial uses. This is not at all the case at Cambridge. The triangle which comprises most of the central area is ringed and interspersed with famous academic buildings, most of which, on grounds of architecture alone, are fixed. Map 12 shows how large a proportion of the buildings in the centre are in academic use. There are therefore two dominant uses in Cambridge's central area, and the first question is how to diminish any existing conflict in their requirements and prevent a renewed conflict in future.

Extension in Emmanuel Road

92 The population of Urban Cambridge was 62,500 in 1900 and is 104,000 today. It would, therefore, be foolish to regard a growth to 150,000 by 1990 as impossible, though for reasons stated later we hope this will not occur. We have mentioned earlier (paragraph 4) that we do not think the central area can efficiently serve a population much greater than the present one. A centre serving a population much larger than this requires more land than is ever likely to be available in the historic centre of Cambridge. In particular, it requires broad streets, capable of taking heavy bus and car traffic, and easy access from all sides or nearly all sides. We see no prospect of fulfilling these last requirements in the traditional central area, and therefore recommend that land should be reserved elsewhere for an extension of the commercial centre, if this becomes necessary in the future. The most suitable place for this extension is, in our view, the land in the angle between Emmanuel Road and Parker St. During the last 20 years the centre of gravity of Cambridge's buildings has moved eastwards, and the centre of gravity of its life has been to some extent artificially restrained from a similar movement by the lack of bridges in the east and the pull of the established central area. Once the new bridges are built there will be, we believe, a natural tendency, if Cambridge continues to grow, to extend the older commercial centre eastwards.

Main aims of proposals

93 We have had these things in mind in thinking of the direction in which the inevitable changes in the centre of Cambridge in the next 20 years should be guided, and what improvements would be most valuable. We believe the aims of proposals should be:—

(i) To improve access to the centre, so that a vehicle can get quickly in or out of its crowded streets;

(ii) To provide a combined bypass and circulating route, broad and free from obstructions, very close to the boundary of the central area.

(iii) To provide some good sites for new shops and offices in the centre, with easy access from the boundary route, so as to reduce congestion in existing shopping streets.

(iv) To try to avoid any big change in the appearance and character of the central area and to ensure that all—or nearly all—our proposals would serve a central area extension on the east, if this is needed, and help the present centre to become something of a precinct in which pedestrian and cycle traffic would predominate.

94 Before describing our proposals, it seems desirable at the risk of some repetition, to explain a seeming contradiction in the aims just stated. On the one hand we mention an extension of shops and offices near Emmanuel Road, the present central area becoming a precinct. On the other we propose to build additional shops and offices in the present central area. We do not think there is any real contradiction here. Nothing in planning has less hope of success than the attempt to remove a well-established shopping centre before the traders concerned have decided that it is in their interests to move. The present central area is bound to remain the principal commercial area for a considerable period. We have taken expert advice on shopping habits and shifts of value in Cambridge and have no doubt on this point. And if population does not grow beyond the figures mentioned later in this report, an extension may not be needed. Our provision for extension is therefore to meet a probable but not a certain future need.

Four main proposals

95 We propose four chief road improvements in the central area in the next 20 years: a relief road on the east side of the spine (Huntingdon Road to Hills Road); redevelopment of the area between Corn Exchange St. and Christ's Pieces; a new bus station; and an improved cross-town route from the Backs road to Drummer St. These four proposals are linked with each other but are best described separately.

I. THE SPINE RELIEF ROUTE

Local-through traffic in the central area

96 A majority of the vehicles which enter the central area make a call at one or more places within it before coming out again. On the other hand some vehicles (unfortunately we do not yet know how many) run right through the centre without stopping, especially those travelling along the line of the spine. Even more vehicles enter at one end of the area and traverse most of it to reach a destination towards the far end, and again this particularly applies to vehicles travelling along the line of the spine. We do not think there is any doubt that traffic congestion in the centre is caused to an appreciable extent by local-through traffic and chiefly by north–south traffic. Nor is the reason far to seek. The spine is the traditional route through the central area and is straight.

Traffic coming south from Huntingdon Road and Histon Road has to use the spine or face a considerable detour over Victoria Bridge or Silver St. Bridge. Moreover, the detour over Victoria Bridge is not rewarded by easy access to the various parts of the central area between Magdalene Bridge and Downing St., and a detour *via* the Backs road provides no access at all to the central area for motor vehicles until Silver St. is reached (see Map 6).

Street widening v. *relief routes*

97 There are two main methods by which this situation could be relieved. The first is by widening existing streets or providing new streets within the area, so that there would be room on each major street for both local-through and stopping traffic. The second method is to leave the existing streets unwidened (or largely unwidened) and to construct a wide relief or circulating route along one or more boundaries of the central area. The aim of this route would be to relieve existing streets both by drawing off local-through traffic and enabling terminating traffic to move along the relief route until it reaches the point nearest its destination within the centre.

Inefficacy of widening

98 We have considered the application of both these methods to the central area. As a result we think a general widening of the carriageways of existing streets would provide little relief to traffic congestion in the centre of the town; and we are quite sure it would bring none commensurate with the difficulties and sacrifices that would have to be overcome and made. This view demands some elaboration and can best be given as regards the spine road, since a scheme for widening the spine has been in existence for a number of years.

99 The spine road, as we have implied by using this name for the succession of variously named parts of a single road, is the backbone of Old Cambridge and of the central commercial area which serves over 100,000 people. It is very narrow, the carriageway between Chesterton Lane corner and Downing St. varying between 15 ft. 7 ins. and about 27 ft. It is flanked on either side by a number of churches and Colleges, and parts of four Colleges are built right up to the inner edge of a narrow footway. The largest stores and multiple shops in the central area are also on the spine. In the three-quarters of a mile between Chesterton Lane and Park Terrace 16 side roads and larger footways enter the spine, and it would not be unfair to call all the junctions cramped and awkward. In addition, the spine offers the shortest route between north-west and south Cambridge, and is A604, a First-Class road, offering the shortest route between Huntingdon and Linton and places farther apart.

100 If the spine cannot fulfil all the functions asked of it in the future there seems no doubt about the one it must fulfil. It must remain a principal distributive road within the central area, enabling goods and passengers to be delivered to all premises. It must continue to do this in the sense that one cannot imagine how the life of the central area can be carried on unless it does. As we see them, all other functions fulfilled by the spine are, to some extent, optional. It would be very inconvenient (in the absence of a good bypass route) if the spine were not available at all to local-through traffic; it would be an advantage to local-through traffic if it were a better route for that traffic than it is now; but only as a distributive route within the central area is its traffic function beyond dispute.

101 It is also, we think, beyond dispute that a widened spine road would much improve general circulation in the central area *provided it could be confined to that purpose*. Unless its use can be so limited, we are sure that no advantage will be gained from widening the carriageway. The spine is, as has been said, very nearly a straight line, and, therefore, a tempting route for local-through traffic. The temptation is at present reduced by the spine's narrowness and congestion. If it is widened some of that portion of local-through traffic which at present avoids it, would begin to use it. There would be no more space for terminating traffic than there was before, but there would be more vehicles, wider streets, greater hazards for pedestrians, and more noise. Something of the present character of the centre would have gone, and some buildings of architectural value would almost certainly have gone as well. That Cambridge drivers on local-through routes are very alert to improvement in a particular route has been shown by the introduction of the one-way system in part of the central area. Before the system was introduced a south-to-north journey up the spine took longer than a circuit round by the Backs road. Since the introduction of the system the journey up the spine takes no longer and usually less time than the circuit. In consequence, motorists travelling along the line of the spine tend to use the spine for northward journeys, whereas previously they made the circuit on both journeys. For these reasons we do not believe that the main remedy for traffic congestion in the central area can be found by widening the streets within it.

The best line for a relief route

102 The alternative was a relief road along one or more boundaries of the centre which would attract local-through traffic, and from which access could readily be obtained to any point in the centre. The most suitable line for such a route, in terms of traffic needs only, was easily found. It runs from Histon Road corner to Drummer St. or Park Terrace, parallel to the spine and between 200 and 300 yards to the east of it. (See Map 6.) A broad, well-graded road on this line would draw local-through traffic off the spine, and also act as an external distributive road for much of the traffic converging on the centre from Huntingdon Road, Histon Road, Chesterton Lane, Jesus Lane and Park Side. As the spine is direct a relief road must be near to it, otherwise traffic will not leave the line of the spine. A road which is to act both as a relief and an external distributive road must be on the east of the spine, because most people live to the east side of it and approach the central area from the

north, north-east, east and south-east. (See Maps 50 and 58.) Thirdly, if the present central area becomes in time a precinct entered chiefly by traffic delivering goods and passengers to buildings, a road on the line mentioned would form a satisfactory eastern boundary. It seemed, therefore, well worth while to study in detail whether a broad road could be constructed somewhere near that line within a reasonable number of years. This we have done: in fact we think we have studied almost every way of constructing a road between Histon Road corner and Drummer St. whether at ground level or otherwise.

103 As a result of these studies, and despite the difficulties they disclose, we recommend the construction of a spine relief road (together with certain other works) as the principal means of reducing traffic congestion in the centre and of preserving its existing character. The route we recommend is shown on Map 6, and in more detail on Maps 13 and 16. The spine relief road is in our view the most important single improvement that could be made in the Cambridge road system. We realise the difficulties of its construction, and the sacrifices it will require; but we see no practicable alternative. In 20 years' time motor traffic will almost certainly have doubled in volume, and twice the present traffic trying to push through existing streets would mean that the central area would be virtually impassable at peak hours. We also think it will be agreed that the spine relief could be constructed in a third of the time and at much less than a third of the cost of widening existing main streets to, say, 50 feet. The main drawback of our proposal—and we recognise it as very real—is that it would require the disturbance in the comparatively near future of quite a large number of owners and occupiers who had no reason to expect disturbance. We have done what we could to reduce this disturbance or to delay it until the particular building is likely to be near the end of its useful life. Nevertheless disturbance and sacrifices will be required, and can only seem justified by being seen in proper proportion. The alternatives are not disturbance *versus* no disturbance. They are, we believe, moderate disturbance in a limited number of places over 20 years *versus* postponement of effort, accompanied by increasing congestion throughout the centre, and finally costly and large-scale disturbance, in an attempt to prevent the centre becoming impassable.

Reasons for choice of route

104 Looking at the proposed spine relief road as a whole (Maps 6, 13 and 16) it will be seen that it runs roughly parallel to the spine and about 200 yards away from it on the average. Distances from Histon Road corner to Downing St. *via* existing routes and the proposed road are as follows:—

	Yards
The spine (now partially closed to southbound traffic)	1,600
The spine including the present one-way detour	1,900
Proposed relief route	2,100
Victoria Road – Victoria Avenue, Emmanuel Road	2,700

These figures go some way to explain why we rejected the idea of using Victoria Road, Victoria Avenue and Emmanuel Road as a spine relief route, though it has the great merit of being already in existence. We saw no way of persuading, or of there ever being general agreement to compel, north–south traffic to make a half-mile detour. Moreover, Victoria Road is very narrow; and Victoria Avenue already carries the heaviest motor traffic of any road in Cambridge and has a very difficult junction at Mitcham's Corner and the Bridge. (See paragraph 84.) The 200 yards extra length of the proposed route, compared with the present route, would be more than offset by its greater breadth, freedom from obstruction and better gradients.

Alternatives considered

105 A route even shorter and with less intersections than that proposed could, of course, be found. The S bend at the northern end, which reduces the gradient (Map 6), could have been avoided by a bridge flying over Chesterton Lane; and the eastward kink at the southern end could have been avoided by a road through Christ's Fellows' Garden. Schemes incorporating both of these possibilities were prepared and were rejected because we could not feel that their advantages justified the extra effort and sacrifice that would be called for. At most they shortened the proposed route by 200 yards. Against this a Chesterton Lane flyover, besides being costly, would diminish the relief route's efficiency as a boundary road which picked up all main roads converging on the central area, and would disrupt both Park Parade and the pleasing group of buildings around Wentworth House, at the east end of Magdalene College. (See Map 13.) The reasons why we do not recommend a straight road from Jesus Lane to Drummer St. are given in paragraph 112 below.

Functions of the proposed route

106 The route is intended, first, to attract local-through traffic travelling along the line of the spine. We propose that when first completed it should have a 30-ft. carriageway, and that the junctions in Jesus Lane and King St. should be controlled by lights favouring traffic on the route. At first sight the route seems likely to attract southbound local-through traffic more than northbound. This would certainly be so if it could be brought into use forthwith, but later in this report (paragraph 158 *et seq.* and Map 20) we propose a new system of traffic circulation for the centre, and under this system the spine relief route would attract local-through traffic travelling in both directions.

107 The second function of the route is distributive. A vehicle approaching the central area from any road from the north-west round to the south-east could run along the relief route until it reached the junction nearest its central area destination and then turn off. Moving from

north to south we propose three entry points to the central area from the relief road: an entry south of Magdalene (roughly on the line Portugal St., Park St., Round Church St.); Jesus Lane; and Emmanuel St. Traffic for the main shopping areas would be likely to make most use of Emmanuel St., from which it could cross into our proposed Guildhall St. (see Map 16).

108 The third aim of the relief route is to encourage the redevelopment of portions of the central area which are at present under-developed or occupied by buildings of poor quality. Easy access from the relief route would encourage rebuilding between Bridge St. and Park Parade and also near King St. These areas would be very suitable for larger garages and perhaps some modern shops and offices. But we hope that the bulk of the land would be redeveloped with College rooms or for general residence.

109 The fourth and long-term function of the route is that it should serve as the eastern boundary of a precinct containing the Old Town.

110 These aims seem to us to justify construction of the relief route during the next 20 years, and if possible in a shorter time. It is, of course, recognised that the benefits of the route are only a part, even if the larger part, of the picture. One cannot hope to carry out a major road improvement near the centre of Cambridge without some regrettable disturbance and loss of amenity. We have tried hard to reduce this loss but in two respects it remains greater than we would have wished.

Use of public open space

111 The construction of the relief route would require the taking over of a strip of Midsummer Common and a considerable portion of Christ's Pieces (when one includes the land needed for the proposed new Bus Station and roundabout). It must be admitted at once that these are proposals to which objection will be taken, especially the second. The need to run a road across Christ's Pieces is in fact the biggest objection to the whole route, and one which can only be admitted if the relief route is accepted as being essential to prevent intolerable traffic congestion in the whole centre. Cambridge is most fortunate in having an almost complete ring of public and private open spaces around its centre; and events in other towns have shown that a possession of this kind can only be maintained by a vigilant public opinion and a refusal to regard public open space as a reserve of land that can be drawn on for public works. We have had this attitude, which has been shown to be held at Cambridge, well in mind. Nevertheless the completeness of the ring of green round the central area has compelled us to propose this one severe slice into it. If one looks at Map 6 the question seems to us clear cut. If a spine relief is not constructed congestion in the central area will become intolerable, sooner rather than later. If the relief does not run fairly close to the spine it will not be used. The proposed route already has an undesirable eastward loop in it for the reasons given in the next paragraph. We have most carefully considered whether the bigger loop, that would occur if the route were taken right round Christ's Pieces, would greatly lessen the attractiveness of the route. We think it would do so. Emmanuel Road is already heavily used by Victoria Avenue traffic and should be left for that traffic; and we see no prospect of northward-bound spine traffic being willing to turn out of its way along a heavily trafficked road as far as the Four Lamps crossing. We think it would be attracted by the new and shorter route when traffic circulation in the centre is changed in the way we later propose.

Christ's College Garden

112 We mentioned in paragraph 105 that a scheme for taking the relief route in a straight line from Jesus Lane (west of Wesley House) to Drummer St. was rejected. This route would have required a portion of Sidney Sussex Fellows' Garden, and would have cut across Malcolm St. and King St. on the diagonal (requiring a new street lay-out in that area), and would also have cut across the centre of Christ's Fellows' Garden. The last two of these had grave disadvantages. Malcolm St. and King St. are cramped between Sidney Sussex, Westcott House and Christ's, and though many buildings there are dilapidated quite a number have years of useful life before them. In consequence there was no elbow-room for a new layout that could be brought into existence within a reasonable time. To cut through Christ's Fellows' Garden presented at least equal difficulties of another kind. It is one of the most beautiful gardens in Cambridge, and with that fatality which sometimes seems to attend road improvers, its Renaissance swimming bath and summer house are at the extreme northern end, and would thus be severed from the College if a road at ground level were taken through the Garden. We attached so much importance to a good route for the spine relief that we were prepared to recommend an attempt to surmount all these difficulties (if necessary by running in tunnel through the Fellows' Garden) until we reached the stage of marrying our proposals for the Bus Station and St. Andrew's St. to those for the spine relief. We then found that whatever we did we could not reduce demands on Christ's Pieces below those contained in our present recommendations. Indeed the most acceptable of the " straight line " schemes—costly both in time and money—required more of Christ's Pieces to be taken than the route now recommended. We therefore decided to recommend the detour, offsetting its departure from a straight line by the fact that it could be constructed far more speedily and at much less cost than a straight route.

Total open space required

113 It may be convenient to list here the total amount of public open space which we propose should be taken for road improvements.

(i) For the spine relief road, bus lay-by and roundabout we propose that two acres should be taken from the present 10 acres of Christ's Pieces. The relief road would also cut Christ's

Pieces into two portions, although the main features of the smaller portion have been preserved.

(ii) For the spine relief road we also propose to take about 1½ acres out of the 29 acres of the western portion of Midsummer Common. This land comprises a strip alongside Park Parade (see Map 13) and is needed for carriageway and ramp to the new bridge east of Magdalene.

(iii) For the proposed new Chesterton Bridge (see paragraph 67 and Map 7) we propose to take about one-fifth of an acre from the 34 acres of the eastern part of Midsummer Common.

(iv) For improving the Four Lamps roundabout about one-tenth of an acre would be required, also from the eastern portion of Midsummer Common.

It will probably be agreed that if some public open space near the centre has to be taken for road improvements the land covered by proposals (ii), (iii) and (iv) above is among that which could be let go with least regret.

Jesus College

114 The second large sacrifice required for the construction of the spine relief would have to be made by Jesus College. We propose that the relief road should run (see Map 13) from the east end of Lower Park St. across the Jesus Hockey Field and emerge into Jesus Lane across the site now occupied by Marshall's Garage. We fully appreciate that Jesus College will hear of this proposal with regret—the more keenly because the College has hitherto been spared the traffic worries and nuisances that afflict a dozen of its fellow Colleges. We can only say that we have failed to find any other route that would effectually relieve the spine; and the fact that most of the property on the Jesus side of Lower Park St. and Park St. is near the end of its useful life also played a part in our decision. The proposed increase of traffic along part of Jesus Lane is also regrettable from the point of view of the College. The part of Jesus Lane which forms part of the new route is nevertheless wide in comparison with most central streets—up to 50 ft. in places—and no part of the College is nearer to the road than 200 ft. We suggest that Jesus Lane should be further widened on the south side as redevelopment takes place.

Marshall's Garage

115 It will be seen from Map 13 that the relief route enters Jesus Lane across the site now occupied by Messrs. Marshall's garage. Part of the garage buildings are comparatively new and their demolition in six or seven years' time was therefore carefully considered before it was decided to recommend it. Among reasons for the decision were that a considerable part of the building is of light construction and that Messrs. Marshall have themselves had a scheme of partial rebuilding in mind for some years, and that this demolition would be the only one of comparable cost needed to complete the section of the relief route from Histon Corner to Jesus Lane. Moreover the poor quality of property in Park St. and Lower Park St. means that the accommodation lost by Messrs. Marshall could be replaced, probably with an improved circulation for cars, on an immediately adjoining site, and on one flanking a traffic route which we hope will become one of the most heavily used in Cambridge. It is, therefore, at least probable that temporary disturbance to Messrs. Marshall's business would be offset by appreciable later advantages.

Histon Road corner to Jesus Lane

116 Other features of the route between Histon Road corner and Jesus Lane are also shown on Map 13. We propose that the carriageway should be 30 feet wide in the first instance but that excavation and embanking should be suitable for an eventual 44-ft. carriageway. The gradient between Histon corner and Chesterton Lane would be uniform at 1 in 45; the road would thus be much more attractive to northbound cyclists than the 1 in 20 (steepest part, 1 in 12) of Castle St. The roundabout (Map 15) is designed to deflect southbound traffic off Castle St. onto the relief route, and as an added attraction to local-through traffic we suggest that the road between Histon corner and Chesterton Lane should provide no vehicular access to adjoining buildings and that only two side roads should enter it. We provide for an extension of the Shire Hall and access to it from the new road by a flight of steps. At Chesterton Lane a very large roundabout, or more properly a system of one-way streets, is proposed in order to avoid the demolition of houses for 20 or 30 years. The one house we propose to demolish in the near future has structural defects.

117 The proposed new bridge has been sited so as to preserve Wentworth House and the adjoining trees and cottages at the east end of Magdalene College Garden. Both Wentworth House and the cottages are included in the Minister's draft list of Cambridge buildings that should be preserved, although some of the cottages are sub-standard as regards structural condition and sanitation. We feel strongly that the new bridge should be made wide enough when first constructed to carry all traffic which is ever likely to use it, thus avoiding the big fault of almost every other bridge in Cambridge. We show a 40-ft. carriageway and two 10-ft. footways. As the bridge will be conspicuously placed its design will require special care. We also propose that Chesterton Lane should be widened, chiefly on the south side, between Castle St. and the proposed new bridge.

118 South of the river, between the new bridge and Lower Park St., we propose that eventually two carriageways might be constructed, with the existing row of trees retained in a strip between them. To begin with a single 30-ft. carriageway should be sufficient. We propose that the relief route should be connected to Bridge St., as redevelopment of poor-quality buildings takes place, by a widened street on the line of Portugal St., Park St. and then by Ram Yard and Round Church St. (See Map 41.)

Jesus Lane to Drummer Street

119 The proposed route between Jesus Lane and the new roundabout at Drummer St. does not require much explanation. We have tried to keep the junction with Jesus Lane as far west as was consistent with a very small amount of demolition and disturbance (Map 16). We recommend that both the Jesus Lane junctions on the new route and that with King St. should be light-controlled in favour of the new route. There are many dilapidated and obsolete buildings in the neighbourhood of King St. and we recommend that the construction of the new route should be followed by redevelopment of the neighbourhood according to an improved layout. We think that if this were done it would attract some new shops and offices. In the route from King St. across Christ's Pieces we have tried to disturb as few familiar features as the nature of the project allowed. We retain Milton's Walk and many of the existing trees, and propose a slight mounding planted with shrubs around the bus lay-by to screen the oil-stained concrete.

Summary of proposals for spine relief route

120 Our proposals for a relief route for the spine from Histon Road corner to Drummer St. may be summarised as follows:—

(i) *We propose that during the first stage of our programme of road improvements* (1951–55) *the whole route as shown on Map* 6 *should be surveyed, ownerships investigated, designs prepared for the new bridge and that properties affected which happen to come into the market should be bought. The cost of property acquisition during this period cannot of course be estimated, but we have allocated* £20,000 *for this stage of the work from our road improvement budget.*

(ii) *We propose that during the second stage* (1956–62) *the route should be completed from Chesterton Lane to Drummer St. Neither of the two parts of this section would be of much value without the other and the part between Jesus Lane and Drummer St. would be relatively cheap. Excluding the* £20,000 *previously mentioned we have allocated* £125,000 *towards the cost of the bridge and the Chesterton Lane to Jesus Lane section of the route; and* £40,000 *towards the Jesus Lane to Drummer St. portion (which excludes the roundabout and Bus Station).*

(iii) *The section from Histon Road corner to Chesterton Lane, including the two roundabouts, is proposed for completion in the third stage* (1963–69). *Although cutting and embanking is fairly cheap with modern equipment, retaining walls will be needed and a good deal of disturbance will be caused to property. We have, therefore, allocated* £125,000 *towards the cost of this work.*

(iv) *Improvements to existing streets will be needed to provide easy access from the new route to the spine road north of Jesus Lane. These improvements should be paid for from redevelopment rather than road improvement funds, but we have allocated* £25,000 *as a road improvement contribution towards the cost of redevelopment.*

2. GUILDHALL STREET

121 Although the central area is small and hemmed in by University and College buildings (see Map 12) it is noticeable that the more valuable shops and offices occupy only a comparatively small part of the land. The spine from St. John's corner to Downing St., Trinity St., Market St., Petty Cury and a portion of King's Parade contain nearly all the principal shops of Cambridge. This is a state of affairs common to many towns. Short lengths of certain streets become popular and congested with traffic, and thereafter it is very hazardous to place a new shop which seeks a large turnover on a site outside the popular area. In consequence values, and traffic congestion, build up in that area; and land only a few hundred feet away may remain neglected. A circle of this kind can only be broken by action of the local authority under favourable conditions. These conditions exist in Cambridge.

Sites likely to be redeveloped first

122 We have discussed the provision of new shopping and office frontage in the central area with the Planning Department's advisory group on retail trade, and they hold that sites which are far from the Town Centre and bus station will not be attractive to developers as long as the road pattern and main traffic flows remain as at present. It was also mentioned more than once that values were tending to move south—i.e. from Bridge St. and Sidney St. to St. Andrew's St. (See Map 12.) It therefore seems to us that during the next 10 years developers with sufficient resources will try to choose sites which are both well in the public eye and within a narrow radius from Christ's College gateway. The area within which new frontages can be provided with the certainty of their being soon developed is thus small.

123 If one looks at the shopping streets listed in paragraph 121 from the point of view of traffic circulation they are seen to form a line down the spine (Sidney St.–St. Andrew's St.) and a projecting triangle on the west (Trinity St.–Market Hill–Petty Cury). Although the one-way traffic system has deflected some south-bound traffic down King's Parade there is no doubt that south of Petty Cury most shopping traffic is canalised in St. Andrew's St. This is partly caused by numbers of shoppers using the bus station, and partly by the fact that there is nothing within the 10-acre street block west of St. Andrew's St. to attract shoppers within that block—or at least nothing except a car park. If, however, a broad new street were cut through between the Guildhall and Downing Place, the concentration of traffic on St. Andrew's St. could be

relieved, and a central area traffic circuit could be established, of which the spine would form one side, and Downing St., the new Guildhall St., Market Hill and Trinity St. the other sides. Moreover, in the long term, traffic coming up Regent St. could be enabled to make a left-hand turn into Downing Place north of the entrance to Downing College and thus feed into the south end of Guildhall St. *via* Downing Place (see Maps 6 and 17).

Guildhall Street

124 We have examined the possibilities of forming the new street, and have found so much in its favour that we recommend that its creation should be the first object of redevelopment in the centre. We envisage the new street —which we call Guildhall St. in the remainder of this report since it is a continuation and enlargement of the present short Guildhall St.—primarily as a shopping street, designed, by the provision of well-shaped plots, broad pavements and easy access, to draw some of the shopping crowds from St. Andrew's St., Petty Cury and elsewhere; but its carriageway would be wide enough to serve as a main route for the circulation of central traffic.

125 The first requirement of a successful new shopping street is that it should be in a place which large numbers of people will be easily persuaded to visit, even if, to begin with, they only pass through it. Guildhall St. (see Map 17) fulfils this requirement. It would have the Guildhall and the market-place at one end and a principal junction on our proposed cross-town route at the other. Its centre would be just over 200 yards' walking distance from both Christ's College gateway (which we take as the present centre of gravity of shopping values) and our proposed new bus station south of Christ's. We also propose that a proportion of local buses should be routed through Guildhall St. directly this becomes practicable.

126 A large part of the land that would be required for Guildhall St. and adjoining new buildings is at present either vacant (being used as a car park) or is occupied by obsolescent or completely outworn buildings. The Borough already own about a quarter of the entire block bounded by Petty Cury, St. Andrew's St., Downing St. and Corn Exchange St., including nearly all the land needed for Guildhall St. and immediately adjoining buildings. We recommend that all redevelopment within this block should take place as part of a unified scheme, and that if it appears necessary for this purpose, land in the block not already owned by the Borough should be designated for compulsory acquisition under the 1947 Act.

Open Deck Car Park

127 The proposed Guildhall St. and adjoining buildings would occupy the whole of the area of the present Lion car park, which is extremely well situated and has a capacity of 150 cars. We consider it important to retain a car park in this area as one of the attractions of the new street, and propose that an " open deck " car park with a capacity of 400 cars should be the first building in Guildhall St. This building, illustrated in Fig. 18, provides six shops and two large motor or other showrooms on the ground floor and three car-parking decks above. As open-deck car parks require no heating or mechanical ventilation their construction and maintenance costs are low. We estimate that the building shown in Fig. 18 could be built for about £160,000 at present prices, and if this proves to be the case there seems no reason why it should not pay its way in addition to being an asset to the new street. Whether it pays its way depends, however, to a large extent on future car-parking policy in the centre, and this we discuss later in this report (para. 173 *et seq.*).

Stages of construction of Guildhall Street

128 It will be seen from Map 17 that we propose that during the first stage of redevelopment (1951–55) the open-deck car park and a block of shops on the opposite side of the road should be built and most of Guildhall St. formed. The second stage would include the erection of the buildings north and south of the open-deck car park, completion of the connection to Petty Cury, and, we hope, the construction of the cross-connection between Downing St. and Emmanuel St. which we have provisionally called New Emmanuel St. We are strongly of the opinion that Guildhall St. will not be a commercial success until it is opened up at both ends, and we therefore recommend that the second stage of operations should follow closely on the first. Once New Emmanuel St. is opened we hope that the buildings between this street and Downing St., west of Downing Place, would be demolished to open up the south end of Guildhall St. completely, and that the redevelopment of the remainder of the east side of Guildhall St. would take place reasonably soon afterwards. In all, Guildhall St. should provide about 1,200 ft. of new shopping frontage, and New Emmanuel St. about 600 ft. This is enough frontage for 34 large shops. It would be a very considerable addition to convenient shopping facilities in the central area, especially when one bears in mind that the footways in the new streets would be 12 or 14 ft. wide and that nearly all premises would have vehicular access at the rear for delivery of goods.

No change of character in the Central Area

129 Another advantage of forming Guildhall St. and New Emmanuel St. is that it would enable the new shops and offices to be built without making any noticeable change in the best-known central streets. The new shopping precinct will require three entrances, but otherwise the older streets would be unaffected.

Summary of proposals for Guildhall Street

130 Our proposals for a new shopping street may be summarised as follows: —

(i) *We propose that during the first stage of our programme* (1951–55) *the larger part of Guildhall St. should be formed and an open-deck car park built. This would form part of a general redevelopment scheme under the* 1947 *Act and would be much more than a road improvement.*

We allocate £50,000 from the £1,500,000 as a road improvement contribution to this work.

(ii) *During the second stage* (1956–62) *we propose that the west side of Guildhall St. should be completed together with the connection to Petty Cury and some redevelopment and minor road improvements on the east side of Guildhall St. We allocate a further £50,000 as a road improvement contribution to this part of the work.*

(iii) *During the third stage* (1962–69) *we recommend that the new traffic centre at the south end of Guildhall St. should be formed by the demolition of buildings on the north side of Downing St. and west of Downing Place. We allocate £25,000 as a road improvement contribution to this last part of the scheme.*

(iv) *Eventually we hope that it will prove possible to form an entry into the south end of Downing Place from Regent St. at a point just north of the present entrance to Downing College, and that north-bound traffic for Guildhall St. will leave Regent St. at this point. We do not expect that this new entry will be formed before* 1970.

NOTE: The cost of New Emmanuel St. is considered in paragraph 152 in connection with the cross-town route.

3. NEW BUS STATION AND NEIGHBOURING IMPROVEMENTS

131 Map 17 shows a proposed new station (for country buses) on the south side of Christ's Lane. There will be little disagreement about the need for a new bus station in Cambridge. Country bus traffic in Cambridgeshire has roughly doubled in the last decade and some further increase seems very probable. The present bus station is very cramped and exposes bus queues to the weather; and necessary services and amenities are provided by scattered small buildings and a mobile canteen.

Advantages of Drummer Street bus station

132 It will also be agreed that the bus station must be very near the centre, since in Cambridge an overwhelming proportion of country bus passengers are travelling to or from places in or very near the centre. On the other hand the station should not be within the commercial area—e.g. in the present Lion car park—because that would require some hundreds of large vehicles to travel each day through the most congested streets in Cambridge. There is only one place very near the Town Centre to which buses can travel in nearly all directions over uncongested roads, and that is the place where the bus station now is. The chief proposals for road improvements shown on Map 6 add to the advantages of a bus station at Drummer St. The problems of the bus station are therefore those of detailed siting and form, rather than of general location; but they are not easy to solve.

Emmanuel Street as the main traffic entrance to the Central Area

133 Country bus passengers are likely to grow in numbers and to play a part of growing consequence as workers and customers in the commercial life of the centre. It follows that the new bus station should be one able to handle much more traffic than the present one, and under better conditions. Provision has, however, to be made in the Drummer St. area for supplying another need even greater than that for a bus station, namely, the main access to the centre from the north-east, east and south-east. The traffic survey (Maps 50 and 51) has disclosed the large amount of traffic which now passes through Emmanuel St., and it was obvious at an early stage in the preparation of our proposals that if a spine relief route and an improved cross-town route from Silver St. also converged on Emmanuel St. it would become a main, if not *the* main, traffic centre in Cambridge. We made a number of studies of ways in which heavy east–west traffic could be arranged to pass the barrier of the two parts of Emmanuel College. For example, we examined the possibilities of a main traffic route between Christ's and Emmanuel North Court, and of introducing one-way streets right round the main buildings and gardens of Emmanuel. The proposals shown in Map 17 represent, we believe, the best means of attaining, within a reasonably short time, four objectives: good access to the central area at the point where this is most needed; an efficient roundabout junction for the three heavily trafficked roads; a bus station of adequate size on the right (that is, the central area) side of the traffic streams; and lastly, to do these things with a minimum of encroachment upon open space and other disturbance.

The new bus station

134 We recommend that the whole of the area between Christ's College and Emmanuel North Court, and also Nos. 63–70 St. Andrew's St., should be acquired by the Borough and redeveloped with shops and offices on St. Andrew's St. and a roofed bus station behind. The station provides for 8–10 buses to load simultaneously and for a further 25 buses in the adjoining lay-by. The roof of the station would reduce the noise reaching adjoining buildings and the double-fronted shops between the station and St. Andrew's St. would occupy the most commercially promising position in Cambridge. None of the buildings that would have to be demolished is of high quality and most are very dilapidated.

135 We do not think this is too ambitious a project for Cambridge in the next 10 to 15 years. Towns of much less consequence have good bus stations, bus companies are doing well, and a new well-appointed station so near the centre of the town would benefit passengers, traders and the bus company. The shops and offices may be regarded as a separate venture which could hardly fail to pay its way in normal times. We have not examined the design of the buildings in detail, but it would be necessary and we think quite practicable to provide for goods access at the rear of the shops.

Local bus stops in the centre

136 Local bus queues and stationary buses in the centre at present obstruct both carriageways and footways, and since local bus routes do tend to attract through and local-through traffic to some extent we have considered whether the bus station could accommodate all local buses now stopping in the Town Centre. We decided that the inconvenience to bus passengers that would result from such a concentration would outweigh its advantages. Our proposals for local bus stops in the central area are contained in paragraph 197. We have not obtained figures of the numbers of people who pass through Cambridge on journeys which comprise both country bus and rail travel, but casual information suggests that this rail–country bus interchange is appreciable. We suggest that the needs of these passengers, and of those travelling between the railway station and Town Centre, could be supplied by a bus running on a shuttle service between the railway station and the new bus station.

137 Our proposals for the new bus station and neighbouring improvements may be summarised as follows: —

(i) *We propose that during the first stage of our programme* (1951–55) *the land between Christ's and Emmanuel North Court and Nos.* 63–70 *St. Andrew's St. should be acquired by the Borough for comprehensive redevelopment, and that at the end of the same period the new bus station and lay-by should be built, entrance to the station being obtained from Christ's Lane and Bradwell's Yard. Although a new bus station is not a road improvement we have allocated* £25,000 *as a contribution towards it.*

(ii) *During the second stage* (1956–62) *we propose that the land fronting on St. Andrew's St. should be redeveloped with shops and offices and the roundabout constructed. We have allocated* £25,000 *towards the cost of the roundabout and ancillary works in Drummer St.*

4. THE CROSS-TOWN ROUTE

138 We recommend that an improved cross-town route be brought into existence between Drummer St. and Sidgwick Avenue. (See Maps 6, 16 and 17.) This route would form the southern boundary of a precinct containing the old town, and would connect directly with the spine relief road—the eastern boundary of the precinct. The two portions of the route which lie east and west of Corn Exchange St. differ greatly as regards the traffic they are likely to carry, and therefore in the degree of need for early construction or improvement, and may conveniently be described separately.

Emmanuel Street and Downing Street corners

139 At present the junction of St. Andrew's St. and Emmanuel St. is the most congested corner in Cambridge at rush hours. This is shown in Maps 50 and 51 of the traffic survey. Traffic entering the central area from Jesus Lane (see Maps 12 and 19) is compelled by the one-way system to turn northwards round St. John's corner; and traffic cannot enter the area from King St. as the Hobson St.–King St. one-way circulation is against it. Thus all traffic entering the centre from the north-east, east, and south-east sides of Cambridge has to pass the St. Andrew's St.–Emmanuel St. corner. The St. Andrew's St.–Downing St. corner, 60 yards away, runs the Emmanuel St. corner close in degree of rush-hour congestion. Workers in the University Press, the laboratories, and in shops and offices west of St. Andrew's St. emerge from Downing St. in large numbers on cycles and in cars and make the left- and right-hand turn into Emmanuel St. (see Map 50).

140 We have found no way of providing for a reduction of traffic along Emmanuel St. On the contrary, as has been stated, we think it must be accepted as the main gateway to the centre from the larger part of the town, and the construction of the spine relief road (despite connections with the central area at other points) would increase the traffic along Emmanuel St. There is no doubt whatever that this must be reckoned with. We, therefore, propose that Emmanuel St. should be widened to provide a 30-ft. carriageway and that vehicles should not be allowed to stop in it. The few shops in Emmanuel St. are likely to be rebuilt fairly soon, and we recommend that it should be made a condition of permission for redevelopment that access should be provided for goods delivery off the public highway. We feel satisfied that if Emmanuel St. is provided with a 30-ft. " Yellow Band " carriageway it will be able to carry all the traffic likely to converge upon it from the east if our other proposals are carried out.

141 It would, however, be useless to bring more traffic into Emmanuel St. if its west end remains in its present condition. Probably something like two-thirds of the vehicles now passing westwards through Emmanuel St. have their destinations between Market St. and Downing St. and King's Parade and St. Andrew's St. (see Map 12) and have to work their way up or down St. Andrew's St. and round *via* Downing St. or Petty Cury. We propose that the new Guildhall St. should take a lion's share in distributing this traffic, and should be enabled to do so by being connected directly to Emmanuel St. by the proposed street we have called New Emmanuel St. (See Map 17.)

Advantages of New Emmanuel Street

142 To drive a 50-ft. street through a central shopping frontage which is both valuable and gaining in value is a severe remedy for any traffic ill. We feel sure that in this case it is justified. In so important a matter it may be useful to repeat the grounds for our belief. It is the southern half of the central area which most traffic wants to reach; most of the traffic comes from the north, east, and south-east and can be marshalled to approach from Emmanuel St. without running through other parts of the centre; and having been so collected it must have proper provision made for its distribution. If New Emmanuel

St. and Guildhall St. are created, traffic from Emmanuel St. can fan out in four directions (up and down St. Andrew's St., up Guildhall St. and westwards along Downing St.) with only minimum interruption of other St. Andrew's St. traffic. We propose that the Emmanuel St. crossing should be light-controlled in three or four phases. We also propose that when New Emmanuel St. is opened, Downing St. should be made one-way in a westward direction and that the buildings on its south-east corner should be set back to ease the left-hand turn out of St. Andrew's St. By these means the Downing St.–Emmanuel St. traffic weave would be abolished and that from Emmanuel St. to Downing St. would be almost abolished.

143 The land required for New Emmanuel St. is now largely occupied by yards or buildings of poor quality. We recommend that these buildings should be demolished and New Emmanuel St. formed during the second stage of the programme (1956–62) and preferably early in that stage. We understand the reluctance of local authorities to call for the demolition of buildings which still have years of useful life ahead of them and which house well-established businesses; and usually we think this attitude the right one. But there are exceptional cases, where the public benefit to be gained from premature demolition is very great; and New Emmanuel St. is one of the two or three places in Cambridge, involving in all about half a dozen buildings, where we recommend this should be done. The creation of New Emmanuel St. in the near future would not only remove traffic from St. Andrew's St. The traffic removed would play a most valuable part in establishing Guildhall St. as a main shopping street.

144 Eventually, as we have mentioned in a previous paragraph, we propose that the New Emmanuel St.–Downing St. junction should be opened out, forming a considerable traffic *place* with a small open space in the middle. A connection, at a later stage, between the south end of Downing Place and Regent St. would also assist in reducing traffic along St. Andrew's St.

Improvements between Sidgwick Avenue and Corn Exchange Street

145 It seems certain that in time it will be necessary to carry out major improvements to the other part of the cross-town route—that from Sidgwick Avenue to Corn Exchange St. Silver St. Bridge is a traditional entry into the central area; until 1889 it and the Great or Magdalene Bridge were the only river bridges open to the public. Chesterton Lane crossing, near Magdalene Bridge, and Hyde Park Corner, connecting with Fen Causeway, are exactly a mile apart; and the only cross-town route between them is Silver St.–Downing St. The number of people living or working in west Cambridge is bound to grow; and as this happens Silver St. will be required to carry heavier traffic.

Defects of the present route

146 The route from Silver St. Bridge to Downing St. has a number of faults as an entry to the centre or as part of a cross-town route. The bridge itself is narrow and closed to heavy vehicles, and Silver St. has a carriageway less than 18 ft. wide for a large part of its length. Traffic from Silver St. making the right and left turn into Pembroke St. has to contend with fast traffic along Trumpington St., and in Full Term the crossing is periodically beset by undergraduates emerging from Mill Lane and Botolph Lane in large numbers.

Probable redevelopment of neighbouring buildings

147 A number of proposals for rebuilding the bridge, and for other street improvements in the neighbourhood, have been made in the past, and the possibilities of large-scale improvements have recently grown more promising. It is now probable that within the next decade the largest part of the University Press will be moved from its present site, and when the site is subsequently redeveloped for other purposes substantial improvements to Silver St. or Mill Lane, or both, would become practicable. In addition, many of the buildings in the triangular block between Botolph Lane and Pembroke St. are coming to the end of their useful life and redevelopment of this block would enable Pembroke St. to be widened.

Two schemes for improvement

148 There are two ways in which the Silver St.–Downing St. route could be greatly improved within the next 20 years. The first is by rebuilding Silver St. Bridge and widening Silver St., mostly on the south side, to provide a 30-ft. carriageway; by widening Pembroke St. in a similar manner on the north side; and by providing linked traffic lights at the Pembroke St. and Silver St. entries which would assist weaving between the two streets. (See Map 6.)

149 The second way is to leave Silver St. and its bridge unwidened, to widen Mill Lane, and to build a new bridge across the south side of Mill Pit to connect Mill Lane with the Silver St. approach road at a point just east of Newnham Grange. (This route is also shown on Map 6.) It is a much more direct route and would keep heavy traffic away from Queens' College. Its big disadvantage is the change it would make in the neighbourhood of the Mill Pit. The present amenities of the east side of Mill Pit cannot be rated highly, but there is a pleasant view from the east side towards Newnham Mill; and Silver St. Bridge, the Anchor landing stage and the old mill sluices are favourite places from which to watch the river in summertime. The new bridge, if its footways were designed for the purpose, would be a better grandstand than Silver St. bridge. It would not, however, be as quiet as the sluices and would make a great change in a familiar scene. Other disadvantages of the direct route are the obstacles to a good crossing of Trumpington St. which are presented by the north-west corner of Pembroke College and the south-east corner of the Pitt Press; and also the presence of the Mill Lane Lecture Rooms in Mill Lane.

150 On a long-term view, however, we feel that the second route, *via* Mill Lane, is the better. It is straighter, is on the most suitable line for a southern boundary of an Old Town precinct, and encourages traffic from west

Cambridge to use the boundary route. If, therefore, the rebuilding of Silver St. bridge can be postponed for 10 years, we recommend that this should be done, and that traffic counts should be made annually at the Silver St. and Pembroke St. junctions to measure the growth of cross-town traffic. A considerable increase of traffic in 10 years would provide strong support for a bold scheme on the Mill Lane line. On the other hand, if Silver St. bridge has for structural reasons to be completely rebuilt in the next three or four years, then we think the first scheme, described in paragraph 148, should be adopted; but in this case we should still recommend that as buildings along Mill Lane are redeveloped they should be set back to provide a 50-ft. street, and thus enable the Mill Lane route to be brought into existence in the distant future.

151 The completed cross-town route from Sidgwick Avenue to Drummer St. would provide the quickest route between at least the southern half of west Cambridge and all of east Cambridge that lies in the arc between Victoria Avenue and Mill Road; and the route would run along the southern edge of the Old Town precinct.

Summary of proposals: Cross-town route

152 Our proposals for a cross-town route from Drummer St. to Sidgwick Avenue may be summarised as follows: —

(i) *We propose that during the second stage* (1956–62) *Emmanuel St. should be widened to* 42 *ft.* (30-*ft. carriageway*), *its alignment slightly changed and sight lines improved at its west end* (*see Map* 17). *We allocate* £30,000 *towards the cost of these improvements.*

(ii) *We propose that New Emmanuel St. should be formed during the second stage as a* 50-*ft. street* (30-*ft. carriageway*). *The new street will be of great consequence in the redevelopment of the* 10 *acres between Corn Exchange St. and St. Andrew's St., but it is primarily a road improvement. We, therefore, allocate* £60,000 *towards its cost.*

(iii) *We recommend that improvements between Sidgwick Avenue and the east end of Pembroke St. should be deferred until the third stage* (1963–69) *unless the condition of Silver St. Bridge makes this impracticable. We have included in our table of comparative expenditure an allocation of* £125,000 *towards the cost of the new route and new bridge on the Mill Lane line, described in paragraph* 149.

CIRCULATION IN THE CENTRE

Proposed limits of street widening

153 Earlier in this report we have stated our belief that the central area could not be made into a satisfactory shopping and business centre for a large town, and that an attempt to do so would destroy the character of the buildings and streets and must fail. We have, therefore, proposed that a certain amount of new commercial accommodation should be provided, and that if further accommodation proves later to be needed, a commercial extension adjoining Emmanuel Road should be encouraged. In short, we recommend that provision of more road space in the centre should not be taken further than is shown in our proposals.

154 It is possible, perhaps even probable, that motor traffic will increase more quickly than population or demand for more shops and offices. Even if this occurs we should not recommend a further increase of carriageway space. We should propose that all reasonable steps should be taken to see that existing road space was fully used, with more necessary uses having preference. When this had been done we think a further increase in traffic would be unlikely. Any tendency to an increase would provide its own cure. If central routes offered no attraction to local-through traffic, it would not enter the centre; nor would local motorists who knew they could not leave their cars reasonably near a central destination. Both these discouragements would promote the full use of the spine relief road. But we also hold the view that full use of the proposed road space could provide convenient access to all buildings in the centre for an indefinite period at the price of a moderate increase in regulation and restriction. We therefore propose that the circulation of traffic in the centre should be changed by convenient stages, as our road improvements are executed, with the aims of excluding all through traffic and of giving vehicles delivering goods and passengers to buildings preference over other moving traffic and stationary vehicles.

Objections to through routes

155 Map 19 shows the present traffic circulation in the central area in diagrammatic form. It will be seen that there are three through routes which are attractive to local-through traffic—the south to north route up the spine; the north–south route *via* the spine, Trinity St. and King's Parade; and the cross-town route from Silver St. to Drummer St. We have proposed earlier that the Silver St. to Drummer St. route should become the southern boundary of an Old Town precinct. Provision for local-through traffic would therefore continue to be needed on this route and should not add appreciably to congestion within the proposed precinct.

156 It would, however, be necessary to remove local-through traffic from the two north–south routes which run through the main shopping streets and carry much more traffic than the cross-town route. When the spine relief road is completed, a proportion of north–south local-through traffic will use it even if the present traffic circulation in the centre were otherwise unchanged. But the route will be an expensive improvement and would hardly be worth while unless it will be fully used as a central bypass; and this will only occur if north–south routes through the centre are plainly less attractive than travel-

ling on the relief route. Thus from the point of view of ensuring that through traffic uses the relief route it is desirable that there should be no north–south routes through the centre which are likely to attract such traffic.

157 An interruption of direct routes up the spine or down Trinity St. and King's Parade would nevertheless hardly be justified if it were done solely in order to turn local-through traffic onto the relief route. In our view a second and stronger reason for doing this is to encourage terminating traffic to use the relief route or the cross-town route as much as possible. At present a vehicle approaching from Regent St. to deliver goods at the top end of Sidney St. runs through St. Andrew's St. and the town centre in order to do so. Similarly a vehicle bound from Huntingdon Road to Regent St. runs through Trinity St., Market St. and St. Andrew's St. An interruption of direct routes would encourage both these vehicles to use the relief route for a portion of their journeys.

Proposed circulation

158 We have considered the various ways in which traffic circulation in the central area could be arranged so as to divert local-through traffic onto the relief route, and also encourage terminating traffic to make use of the route in travelling to and from the central area. Map 20 shows the circulation which we think would best achieve these aims when the proposed new streets and other road improvements have been made. At present the central area is regarded from a traffic point of view, in two separate ways: as a precinct with two main uses and a very special character; and as an obstruction through which traffic up and down the spine must be enabled to plough its way more or less easily. We propose that when the relief and cross-town routes have been constructed the second view of the central area should be abandoned. It should be regarded as a precinct flanked by the river on one side and by the spine relief and cross-town routes on the other sides, and road access and circulation should be arranged primarily, and if need be almost exclusively, to enable goods and passengers to be delivered to buildings in it. To this end the centre has been divided into four sectors. Three of these have one side resting on the relief route or cross-town route and traffic bound for any one of them has a convenient circuit provided for it from the relief route and back again. The fourth, north-west, sector is not so conveniently placed for traffic from the south, but traffic from the north and east can reach it fairly easily (see Map 20). We think the system offers the most convenient practicable routes to terminating vehicles which approach their destinations from the nearest portions of the relief route or cross-town route, and that such traffic would be better served than it is at present.

159 It may be objected that the qualification begs the question—that a large number of drivers will insist on entering the centre at the point nearest their direction of approach and that the proposed system is therefore too complex. There are several answers to this. We believe it can be demonstrated that the majority of drivers quickly learn the easiest routes to and from their usual destinations, and habitually use them. Secondly, the difference between the proposed circulation system and that now in existence is not large (compare Maps 19 and 20). We provide four new roads, three of which are broad and specially designed to take heavy traffic; and we propose that King's Parade and St. Andrew's St. should be one-way and that eventually Magdalene St. should be closed to vehicular traffic at its junction with Chesterton Lane. The traffic relief provided by the four new streets is likely to outweigh any added complexity in circulation. Lastly, a driver will still be able to enter the centre at any point (with the exception of Magdalene St.) to reach any destination. He will, however, nearly always find it an advantage to choose his point of entry to suit his destination. This arrangement gives the driver more than it takes away from him.

Proposal to close Magdalene Street to motor vehicles

160 The proposal that eventually Magdalene St. should be closed to motor and horse-drawn traffic calls for special explanation. The road through Magdalene St. from Castle St. across the Great Bridge towards the Town Centre, was the first road in Cambridge, and was the main reason why Cambridge came into existence. A decision to close a portion of it to motor traffic would therefore be momentous and could hardly fail to arouse opposition.

161 We were led to our proposal by a number of considerations, in which the route's historical associations had a prominent place. Passers-by are at present reminded of the route's antiquity by many of the adjoining buildings. The present width of Magdalene St. and the buildings on its west side preserve conditions that have existed for four or five centuries. It is one of the few places, even in Cambridge, where this happens. Nearly all the buildings on the west side of Magdalene St. are included in the Minister of Town and Country Planning's list of buildings of historic interest and architectural value, one being in the 1st class, six in the 2nd, and thirteen in the 3rd. If those buildings were swept away in order to widen the street to 50 ft. or more, the street's character, a constant reminder of the route's antiquity, would be wholly changed.

162 The widening of Magdalene St. has been advocated in the past to ease the flow of traffic up and down the spine and from north-west Cambridge to the centre. We take the view, on the basis of much fuller traffic studies than have been made before, that it would be unwise to bring into the centre more traffic than can circulate with tolerable ease in its narrow streets and past its awkward corners. To do otherwise would not diminish congestion; it would just transfer it from, say, Magdalene St. to Trinity St. or Sidney St. We therefore propose that the decision to treat the centre as a precinct, which we feel sure will eventually be inevitable, should be taken at once, and that traffic should be deflected from it as soon as the necessary road links can be made. This would enable the old buildings in Northampton St. and on the west side of Magdalene St., together with the College and its gardens, to be retained in their present ancient grouping and

largely ancient form. The proposal also takes account of the fact, which we believe will be generally admitted, that the larger part of the southward traffic over Magdalene Bridge is bound for the southern half of the central area—i.e. the part south of Market St. Diversion of this traffic would therefore relieve the northern half of the central area from a great deal of traffic which merely uses it as a passage-way.

163 We have considered whether both routes from the north-west—both the spine and the spine relief route—should be left open to motor traffic, allowing traffic to take its choice. We do not recommend this. We think the decision to close Magdalene St. would give traffic, new building development and local habits just that push in the right direction which might make all the difference to the future of the town. To keep both routes open would keep the northern portion of the central area (a large portion of which needs redevelopment) in an unsettled state. Traffic would tend to oscillate between the two routes, according to which was temporarily the quicker, and developers who might be ready to build a big garage near the new route, if they were sure it was going to be the main traffic route, would not do so if it was merely going to be a periodic overflow. And those who were thinking of building flats or College extensions on other sites would be in a similar state of uncertainty.

164 We have also examined the inconvenience to residents in north Cambridge which would be caused by the closing of Magdalene St. to motor traffic and do not think it would be great. Of all those who live north of the Madingley Road–Chesterton Road line, 13 out of 14 live east of the spine. Most of these would approach the centre by the new Chesterton Bridge or Victoria Bridge and would be unaffected by the closing of Magdalene St. Those who approached from Huntingdon Road and Histon Road—an appreciable proportion—would be inconvenienced to the extent of the detour *via* the spine relief. But this would be smaller than may at first be supposed. The present route from the Huntingdon Road corner of Storey's Way to Joshua Taylor's corner is 2,150 yards long. *Via* the spine relief, Jesus Lane and Sidney St. it would be 2,350 yards and most of this route would be broad and unobstructed. From the same point to the University Arms Hotel, the distance is at present 2,800 yards. By the new relief route the distance would be 3,100 yards and once again nearly all of the new route would be broad and unobstructed. In general, traffic from Huntingdon Road to points on the spine would have to travel little extra distance by the new route, but similar traffic bound for points on Trinity St. and Trumpington St. would have to travel a quarter to half a mile farther if it made full use of the relief and cross-town routes. The latter traffic is much smaller in volume than that bound for points along the spine. This is a major point. If Victoria Road and Victoria Avenue were used as the relief route the great mass of Huntingdon Road traffic, which is bound for points on the spine, would have a half-mile extra journey on a route already heavily used and with several bottlenecks. By the new spine relief route the great mass of traffic would have to travel only 100 or 200 yards farther and over a new and unobstructed route. Only a minority of traffic would have to travel any considerable extra distance.

165 The most seriously inconvenienced traffic would be that wishing to travel from Madingley Road to a point in the northern part of the central area. For example, from the Grange Road–Madingley Road junction to Trinity College is 1,250 yards by the present route and would be 2,100 yards by the new route, an increased distance proportionately greater than others we have measured. Against this inconvenience it seems fair to set the facts that very few people live in the northern half of west Cambridge, and that its spaciousness and seclusion is due, in part, to its lack of direct routes from the centre. Some added difficulty of access might therefore not be wholly a disadvantage. Moreover, one has to remember that any circulation system involving restrictions must make some journeys more difficult or lengthy than they were before. If, for instance, a conscientious motorist wishes to travel from the car park of St. John's College to St. Clement's Church (a straight-line distance of 90 yards) he is obliged by the present one-way system to travel half a mile to get there. The test of any circulation is the fewness of such cases, and the greater ease of the vast majority of journeys. By this test, as well as for the other reasons we have given, we think the proposal to close Magdalene St. to motor traffic would be justified.

Present one-way circulation reversed

166 It will be noted that we propose that the present one-way system through Trinity St., Market St., and Sidney St. should be reversed. We were naturally unwilling to propose this change and only accepted its necessity when we were convinced that its retention—after our proposed road improvements have been carried out—would prevent that discouragement of through traffic in the centre, which is one of the main aims of the new circulation. The closing of Magdalene St. to motor traffic would also remove the chief reason for circulating in the present direction, which is to deflect southbound traffic off the spine and to encourage those vehicles which are not compelled to return to the spine at Market St. to continue their journeys *via* King's Parade and Trumpington St. and to return to the spine outside the congested area. (See Map 19.) There is no doubt that this happens and that congestion in St. Andrew's St. has been appreciably reduced. But in the scheme we recommend (Map 20) the division of southbound traffic into through and terminating takes place outside the central area on the spine relief, and the only traffic entering the centre at St. John's corner (*via* the new Round Church St. connection) would be that bound for nearby points. Southbound traffic now deflected at St. John's corner does not return to the spine unless it has to: neither would southbound traffic travelling on the spine relief.

167 Map 21 shows the best scheme we have been able to evolve for a future circulation which retains the present one-way direction around Trinity St., Market St. and

Sidney St. It will be seen that this scheme is very likely to tempt through traffic from the south to try to run through the central area along the spine. The only discouragement to such traffic would be the closing of Magdalene St. (at the north end) and the proposed new connection between St. John's corner and the spine relief (*via* Round Church St.) would be a tolerable substitute for Magdalene St. In addition, all traffic for destinations in the northern end of the centre would be tempted to travel through the southern, and more congested, portion of it: whereas it is our aim to encourage at least a portion of this traffic to use the spine relief route. For these reasons, and the others described in paragraphs 156–158, we recommend that at an appropriate time the present one-way circulation should be reversed. As has been mentioned earlier, our proposed circulation (Map 20) will still enable traffic to travel from end to end of the central area, but it seems likely to induce nearly all local-through traffic and a good proportion of terminating traffic to use the spine relief road and cross-town route.

Visiting Motorists

168 We have had in mind that a traffic circulation incorporating a number of one-way streets is confusing to drivers unfamiliar with the system, and that Cambridge is likely to attract many visitors who are motorists. We see no way of assisting visiting motorists except by careful sign-posting and we recommend that full use be made of signs to encourage traffic to travel on the spine relief and cross-town routes. We think the visiting motorist will find it less worrying to be able to keep moving steadily (even if he is not quite sure where he is going) than to be stuck in congested two-way streets, and that this will certainly be so if the way to the nearest car park is clearly indicated at various points.

Circulation near Market Hill

169 Map 22 shows to a larger scale the proposed future circulation near Market Hill. The first point to be noted is that (with one exception) there are no cross-cuts at all in the paths followed by vehicles: that is, no vehicle has to cross the path of another in such a manner that a head-on collision is possible, and the risk of right-angle collisions is greatly reduced. Vehicle paths converge and diverge but do not cross. The absence of cross-cuts is a great merit in a traffic circulation provided the advantages it offers in smooth flow and faster progress are not abused. If through traffic largely avoids the centre in future there should be no great temptation for vehicles to travel fast, but the absence of cross-cuts may lead to increased speed and may make it more difficult for pedestrians to cross at busy points. We therefore propose that light-controlled pedestrian crossings should be installed at three or four points around the centre, and should be timed to impose a speed limit of 10 m.p.h. on the main traffic flows, or 7 m.p.h. when allowance for stop and start has been made. By the use of this control a vehicle which tried to travel at an excessive speed would gain nothing as it would be stopped at the next crossing.

Petty Cury

170 We would prefer Petty Cury to be closed to motor vehicles at its west end and thus grant pedestrians the priority in that street which they at present claim from necessity, but it would be very difficult to provide a turn-round for vehicles serving the shops. We therefore propose, as an interim measure, that Petty Cury should remain one-way but that the flow should be reversed, to run from west to east. It will also be seen on Map 22 that we recommend a considerable setting back of buildings on both sides of the west end of Petty Cury, so as to improve the entrance to the new Guildhall St. This is another of the few cases where we have felt regretfully compelled to propose that buildings should be demolished or partially demolished before the end of their useful life.

Market Street and Market Hill

171 Other improvements shown on Map 22 are those to the corner of Messrs. Joshua Taylor's, and the widening of Market St. to increase the width of footways.

172 Our proposals for traffic circulation in the centre may be summarised as follows: —

(i) *Local-through traffic should be kept outside the central area by provision of the spine relief road and cross-town route, and by interrupting north–south through routes in the centre. By similar means, traffic bound for the centre should be encouraged to use the spine relief route for part of its journey.*

(ii) *In order to ensure deflection of local-through traffic and for other reasons, we propose that Magdalene St. should be closed to mechanical and horse-drawn traffic at its north end.*

(iii) *The future circulation recommended for the central area is shown in Maps 20 and 22. It comprises four traffic circuits, and gives priority to terminating traffic. The proposed circulation would require a reversal of the present one-way system in Trinity St., Market St., and Sidney St. The circulation would abolish traffic cross-cuts in the area around Market Hill.*

(iv) *We suggest that, eventually, Petty Cury should be closed to mechanical and horse-drawn traffic at its west end and that in the interim it should remain one-way but with the flow reversed to run from west to east.*

CAR AND CYCLE PARKING

173 The system of traffic circulation described in the preceding paragraphs is intended to provide convenient access to all buildings in the central area for many years to come and even if traffic in the County doubles in volume. As we see it, there is only one contingency

which is at all likely to lead to a breakdown of the system, and that is a continued increase in the number of vehicles stationary on the public highway.

174 Stationary vehicles, usually motor cars, are a problem in every central area and specially in Cambridge, where streets are narrow, the total land area small and access restricted. The issues are simple, but reaching the right decisions is very difficult. It involves, as we see it, more than striking a rough balance between the interest of the motorist and the non-motorist. It requires an attempt to estimate the real benefit to the whole town of liberal and restrictive parking policies; and a readiness, if need be, to put up with the inconvenience of giving a fair trial to two or three policies in succession. In the following paragraphs we try to summarise the problem in Cambridge and propose the course of action which seems best to us. But our proposals in this field should be prefaced by the admission that, in our view, experience of the needs of different sections of the population may outweigh purely technical considerations.

The case for restriction of street parking and waiting

175 If, under present road conditions, vehicles stationary on the highway in the central area were confined to those setting down or picking up goods and passengers, there would be virtually no traffic congestion (see Map 52); and if our proposals for new streets and a new circulation were adopted a similar ban would prevent congestion even though the total of traffic circulating in the centre were very much more than it is now. These contentions cannot be proved, but most people are likely to grant their truth. A case could therefore be made out for a severe restriction on stationary vehicles. It can be said, for instance, that on Friday, January 14th, 1948, between 11 a.m. and 12 noon, 328 motor vehicles were parked in central streets outside the authorised places, while at the same time there was enough space in nearby public and private car parks to accommodate all of them. If one assumes that each of these vehicles contained the driver and one passenger, it could be further maintained that the convenience of these 650 people was receiving unreasonable consideration at the expense of the 8,000 or 10,000 other people who were probably in the central area at the same time. In addition it must be admitted to be very galling for an owner to surrender land for street widening and then to see the surrendered space occupied by parked vehicles. The case for the severe restriction on street parking is strengthened in proportion to the amount of parking space off the public highway which is or could be made available.

Reasons for allowing street parking

176 On the other side, strong reasons can be given for allowing street parking in the central area—the strongest, perhaps, being that it *is* a central area, where the convenient use of every form of transport is vital. It can be held that although motorists form only a small part of the central area population they include many of the most active professional and business people, who have to make many calls during the day, and also many shoppers whose patronage is of great benefit to the principal shops. The extent to which, under present conditions, nearby parking facilities benefit shops may be disputed; but they are of some benefit, and the benefit is likely to grow as petrol and new cars become more plentiful.

177 The policy adopted in Cambridge should, we think, be influenced by three special factors: the character of the centre, the general use of cycles, and country shopping traffic on Saturdays.

Special character of the Central Area

178 The larger part of the central area is occupied by University, College and public buildings, many of them world famous, and business and shopping is therefore not the predominant but only one of the two major uses. Shops and Colleges are in an intimate partnership from which both benefit and together they create the character and charm of the central streets. For both sides the partnership has advantages and drawbacks. The shops benefit from the attractive power and custom of the University. On the other hand the large-scale improvements for commercial reasons, which are possible in an area where commerce is dominant, are not possible in Cambridge. If the character of central Cambridge is to be preserved, shopping streets cannot be widened to provide waiting lanes on either side, and only in rare cases can street blocks be comprehensively redeveloped to provide internal car parks of any size. Under these conditions, a general freedom to park in narrow streets might be of doubtful benefit to retailers. Three cars will fill the frontage of quite a large shop and if early arrivals (not all of whom would be shoppers) were inconsiderate in the length of time for which they left their cars, freedom in parking might injure retail trade almost as much as no parking at all.

Heavy cycle traffic

179 In fine weather pedal cycles are used by a large proportion of Cambridge people of every type and all ages from about eight upwards. On a Saturday morning more than 2,500 cycles are parked in central streets and passages at one time. (See Map 53.) A cycle is silent, emits no fumes, takes up little road space and when it collides with another cyclist or pedestrian, injuries are usually slight. Many Cambridge car owners use cycles for local journeys and it is likely to be agreed that it would be most unfortunate if car-parking policy encouraged the use of cars rather than cycles for local journeys.

Saturday afternoon congestion

180 After mid-day on Saturday a big change takes place in the centre. It becomes to a special degree the county market town and is visited by large numbers of country people by car and bus. Car-parking demand increases greatly, although probably few Cambridge car owners visit the town on Saturday afternoons. On Friday, January 14th, 1948, there were enough vacant places in

off-street parks (excluding New Square) to take all the cars parked in unauthorised places in streets. The next afternoon, all these places were filled, New Square had 270 cars in it and 480 were parked in unauthorised places. A car-parking policy well fitted to Cambridge's needs should make some special provision for the needs of Saturday visitors.

Gradual reduction of street parking proposed

181 These various special conditions in the central area and the figures given in the Appendix seem to us to justify a policy of trying steadily to reduce the number of vehicles stationary in central streets, while making sure, in most cases, that parking is not banned until the displaced motorists have a reasonable alternative. We propose a number of means to this end.

Open-deck car parks

182 We have recommended that the Borough should build or ensure the building of a three-floor open-deck car park in the new Guildhall St. with a capacity of about 400 cars. This park would be 150 yards' walking distance from Market Hill, Petty Cury and St. Andrew's St., and if Guildhall St. prospers will probably be in the centre of the future main shopping area. Only very rarely is it as convenient to use a car park as it is to stop outside one's destination, and there are very few people who will pay 6d. for a car park if they can avoid it. But when one bears in mind the advantages which a motorist has in ease of movement over a pedestrian, bus passenger or cyclist, the cost of widening St. Andrew's St., or Petty Cury, and the probability that, if they were widened, twenty-minute waiting would be allowed in them, then it does seem that there would be a case for encouraging motorists visiting these streets to use the new car park and for keeping the charges for short-period parking very low.

183 We propose that the provision of two other car parks should be encouraged, both near the spine relief route. One of these (see Map 20) is in the angle between Portugal Place and Park St. and the other is in King St., between Malcolm St. and Manor St. Both sites are at present occupied by very dilapidated property. It may be said that both these sites and especially the first are too far from the main shops and would never be fully used. We hope that their position on the spine relief road will tempt enterprising firms of motor engineers and garage proprietors to open service garages with parking accommodation, and that provision will be made for the later addition of extra car-parking floors. If parking accommodation is made available at a reasonable price on these or neighbouring sites it seems just that stationary vehicles should not be allowed to remain unattended in adjoining streets if they cause any noticeable congestion.

Provision for rear access to new buildings

184 Our third recommendation is that every large new building in the central area—academic, public, or commercial—should provide space for goods vehicles to unload off the public highway, and also a small private car park where this is in any way practicable. We propose that similar provision should be secured by co-operation between owners in the redevelopment of the more densely built street blocks where no one building plot is large enough to have a private loading space or car park. When the first application is made for redevelopment within such a block we suggest that the Planning Department in collaboration with the Borough Surveyor should prepare a lay-out for the whole block which would provide all or most of the plots with access for goods vehicles off the highway. In some places, e.g. the south side of King St., it may prove impossible to provide loading space off the public highway and also provide commercially attractive plot depths. In these cases, which should be few, vehicles unloading goods could be given priority over other stationary vehicles.

Extra parking space on Saturday afternoons

185 Traffic congestion in the central area on Saturday afternoons, when the County comes to town, seems to justify a special effort to meet their needs for these few hours each week. The fact that 100 twenty-minute waiting spaces were empty on a Saturday afternoon when all other accommodation was packed suggests that shoppers by car at this time do not try to move from place to place but want to park their cars for considerable periods. We propose that on Saturday afternoons most twenty-minute waiting spaces should become car parks. Secondly, most of the University (as distinct from College) buildings are little used on Saturday afternoons. This suggests that the University might consider whether it could allow the courtyards and internal roads of the Downing site (the area between Downing St. and the grounds of Downing College) to be used as a public car park between, say, 2 p.m. and 6 p.m. on Saturdays. There is no doubt that the permission would be a great boon. Two hundred cars could be parked on the site without any overcrowding—nearly half of the cars parked in unauthorised places on a Saturday—and the nearness of the site to St. Andrew's St. and the new Guildhall St. would be a great advantage for County shoppers. The proposal would require to be carefully examined; for instance it would clearly be necessary to charge a little more for parking on the Downing site than in other parks to ensure that it would be an overflow park and not a first choice, and University workers would have to sacrifice the opportunity of using Saturday afternoons for quiet and uninterrupted work. Nevertheless if the concession can be reconciled with the University's prime function it would greatly contribute to solving the Saturday afternoon problem.

Cycle parking

186 Map 53 shows the very large number of cycles which are parked in the centre on a Saturday morning. Over 2,500 were counted and the larger proportion of these were standing at the kerbs or leant against buildings

in main streets. It is also stated in the Appendix that parked cycles are an annoyance in streets where footways are narrow, and contribute to street accidents; but that a great deal of the convenience of a cycle lies in being able to leave it outside one's destination—at least for a short period—and that this is an almost universal Cambridge habit.

187 We do not think there is any way of quickly reducing the number of parked cycles in the narrower streets where they congregate most thickly at present. Some improvement could be obtained by increasing the number of cycle racks of the type in which the cycles stand alternatively horizontal and tilted up at an angle: for example, by the alteration of a portion of the railings and boundary walls around the churches in the central area into this type of cycle rack. It may be maintained that it would be objectionable to place the churches behind a palisade of bicycles. We think this could be decided only by experiment. We suggest that only a portion of the churchyard boundaries should be so treated. At present a large part of these boundaries is occupied by cycles placed end to end, and it seems possible that a combined rack and railing, not more than 4 ft. 6 ins. high, could allow cycles to be parked side by side and also be pleasant to look at when empty. We also propose that cycle racks should be placed in the Market Place on part of the area now used for car parking.

188 In new streets and when existing street blocks are redeveloped we recommend that generous provision should be made for parking cycles. As a general rule we propose that the first 4 ft. of footways, from the kerbside, should be regarded as reserved for cycle parking and either be slotted or lined with slotted blocks of the type now in use. Both of these methods have drawbacks for the pedestrian, but if attention is called to each batch of slots by a guard-rail at each end, the advantages should greatly exceed the disadvantages. In addition, one or more cycle parks should be provided in each new street and as part of the redevelopment of each street block. Street frontage is precious in the central area and it will only rarely be possible to provide a cycle park by a recess in the street frontage. Normally therefore the parks would have to be provided in the interior of blocks, as part of the provision for rear access to buildings by goods vehicles, or in pedestrian ways that are wide enough. Other positions which we think should be made use of in the centre are the larger traffic islands, like those at the north and south ends of the new Guildhall St.

189 The general problem of cycle parking at Cambridge seems to us to merit fuller study as road improvements take shape. In particular, we recommend that the experience and methods of the larger Dutch cities, where cyclists are very numerous, should be used to test proposals for Cambridge.

190 Our proposals for car and cycle parking in the central area may be summarised as follows:—

(i) *The number of stationary vehicles on central streets should be gradually reduced and a reasonable amount of off-street parking space provided in each part of the centre.*

(ii) *Three car parks are proposed: one of open-deck type in Guildhall St., which would be built first: and two others, possibly of open-deck type, near the spine relief road on the east side of the central area.*

(iii) *Every larger new building project should provide for the unloading of goods within the plot boundary and, if possible, for a small car park for those visiting the building.*

(iv) *A layout plan should be prepared for the redevelopment of each street block in the central area and should provide for rear or internal access for vehicles and, if possible, for a small car park.*

(v) *Special provision should be made on Saturday afternoons for county residents shopping by car. A large proportion of twenty-minute waiting spaces might be used as car parks at this time. We also propose that the University should examine whether it could allow internal roads on the Downing site to be used as a car park for four or five hours on Saturday afternoons.*

(vi) *A proportion of the railings around central churchyards might be altered to serve as cycle racks.*

(vii) *We propose that cycle parks should be provided in new streets, in internal courts in redeveloped street blocks and on larger traffic islands. On all pavements over 10 ft. wide we propose that the 4 ft. nearest the kerb should be reserved for cycle parks and be equipped for this purpose.*

(viii) *The methods and equipment used for the parking of cycles in Dutch cities should be studied.*

PEDESTRIANS IN THE CENTRAL AREA

191 In spite of the heavy motor and cycle traffic which runs through it the central area is still to a great extent a pedestrian centre, and one where movement still retains some leisureliness and provides temptations and opportunities to stop at book-stalls and look at buildings. Considerable numbers of people move about the centre entirely on foot. Public opinion is still far from admitting that wheeled traffic has the right of way in the narrow central streets. The underlying aim of the proposals described in previous paragraphs is to keep this part of the character of the centre.

192 Nearly all our proposals for improvements in the centre should make things easier for the pedestrian. Among them are the discouragement of through traffic, provision of off-street car parks, the new Guildhall St. with broad pavements, the proposed closing of Magdalene St. and Petty Cury as thoroughfares for general vehicular traffic, and the light-controlled pedestrian crossings to

reduce the speed of circulating vehicles and provide safe crossings at the four or five busiest points. The new bus station and direct pedestrian routes from it to Petty Cury and Guildhall St. should also be a great convenience to pedestrians who arrive by country buses.

Widening of footways

193 When these improvements have been made the chief remaining obstacle and annoyance for pedestrians will be the narrow footways in Trinity St., Market St., St. Andrew's St. near Lloyds Bank, and in a few other places where there is heavy pedestrian traffic. Redevelopment of adjoining buildings at certain of these points is under consideration and when application is made for planning permission it will be necessary to decide whether any setting back should be required. We have stated our view that it would be unwise to widen carriageways in the centre, except where this is necessary for the improvement of specially awkward corners. But widening of footways is a different matter. It would be a convenience for pedestrians and cyclists, increase the efficiency of existing carriageways and the amount of daylight reaching adjoining buildings, and would reduce noise and fumes. On the other hand, widening footways might take something away from the pedestrian character of the centre. It would tend to encourage the belief of drivers and riders that pedestrians should never venture on the carriageway, and thus encourage higher speeds, and if carried out by normal setting back would change the appearance of the streets.

194 One must be careful not to attribute too much or too little of the character and charm of a street to its narrowness. For example, the contrast between buildings, the informality of the smaller buildings and the front of the Blue Boar on the outside of the curve comprise most of the virtues of Trinity St. Change many of the buildings—as they certainly will be changed before long—and it may be said that the street's present character will have largely gone. But we do not think this will necessarily be so. The narrowness of the street and even of the footways seems to us to contribute a good deal of its air of a small-scale market-town intimacy, and we value the contrast between Trinity St. and the openness of King's Parade at one end and the more moderate width in front of Trinity and St. John's at the other. Provided that buildings are not rebuilt in too large units or on too large a scale we see no reason why the general form of Trinity St. should not be retained even though it changes in detail.

195 For these reasons we recommend that widening of footways in Trinity St. should be modest, and that the street should not be increased in width to more than 35 ft. between buildings. We have considered whether the wider footways could be provided within arcades, thus retaining the present width of the street above ground-floor level, but do not think this treatment would be successful. In so narrow a street the arcades would be very gloomy and the increased width we propose—8 to 10 ft.—would appreciably improve the daylighting of adjoining buildings and should not greatly change the character of the street.

196 We propose that any widening of Petty Cury should be kept within similar limits. It would also be an advantage if means could be found to widen Market St. on the south side, to the limits permitted by the north-west porch of Holy Trinity. This could be done by arcading the ground floor of the Henry Martyn Hall to allow a footway to run through it. The completion of the partial widening on the west of Sidney St. between Holy Trinity and Petty Cury would also be a benefit by providing an ample space for pedestrians and for some extra cycle racks at the present centre of shopping.

Proposed Bus Stops

197 The obstruction to pedestrian movement caused by local bus queues on narrow pavements was very noticeable when the pedestrian survey was made. Bus queues may grow fewer in Cambridge, but it is not likely that it will ever be possible to abolish them. A town which relies so largely on bicycles in fine weather cannot expect both cheap fares (which it now enjoys) and a very frequent service: and the fact that many fair-weather cyclists take to the buses in wet weather is bound to cause some queues. If our proposals are accepted it would be possible to place all local bus stops at points where the footway is broad. For example, northbound 101 and 106 buses could stop in Guildhall St., Market Hill and between Trinity and St. John's. Southbound buses could stop in Jesus Lane, Market Hill and Guildhall St.

CHAPTER TWO

GENERAL DEVELOPMENT

The Urban Cambridge Area

A PLAN which is intended to guide development in Cambridge for the next 30 or 40 years should take account of a larger area than the present Borough. The great mass of additional development in the Cambridge district will no doubt take place within the Borough and we hope that the day will never come when the whole of the Borough is built up. But in two directions the town is linked by continuous ribbon building with considerable settlements outside, and it seemed to us that a plan for Cambridge would be unreal if it did not include these and other developments, present and possible, within a radius of 4 to 5 miles around the town. Map 23 shows the area considered in this report, which has come to be called Urban Cambridge. It is almost the same as that with which the Urban Sub-Committee are concerned—the difference being that where the Sub-Committee's area includes only part of a parish, our Urban Cambridge, for statistical reasons, includes the whole parish. The exact boundary has no planning significance. Urban Cambridge contains 44,000 acres compared with the Borough's 10,000.

POPULATION

I. THE GROWTH OF CAMBRIDGE

199 The most significant aspect of the growth of Cambridge's population is its quickening since 1921. Increases in the Borough alone may be held to be partly artificial because of boundary changes, but this does not apply to the larger area of Urban Cambridge. Table 2 shows that in 1911/21, 1921/31 and 1931/48 the population increases were respectively 6, 14 and 24 per cent. These are very large. Just before the recent war the Barlow Commission investigated the movement of population towards London and the south-east since 1911. The figures in Table 3 show that increases in Urban Cambridge have outstripped those of London and the Home Counties, and suggest that the halt in London's growth during the past ten years may have been partly achieved at Cambridge's expense. A forecast of the 1948 population of the Borough based upon the age and sex structure in 1931, yields a total of 69,000, suggesting that net immigration during the past 17 years has been of the order of 17,000 persons.

200 Up to 1860 Cambridge was a University and market town and a rail centre. There were then about 45,000 inhabitants in Urban Cambridge. Abolition of University religious tests and development of the University's scientific work contributed to a rapid growth in University population in the last part of the century. Undergraduates numbered 1,500 in 1860 and 3,800 in 1911. Modern industrial development also dates from the latter part of the century. Chivers' factory opened in 1873 and that of the Cambridge Instrument Co. in 1881. The growth of population since 1900 and especially since 1919 seems to have taken Cambridge rather by surprise. One has the impression that in each decade since 1900 many people in the town have been dismayed at this continuous growth and have hoped that they would soon see the end of it. The life and resources of the town and region seem to have been the subject of few studies by the University and this may have contributed to an under-estimate of future growth. Up to 1921 the growth of the University was largely responsible for the growth of Cambridge. Future growth will be controlled by non-University employment. The change since 1931 in the way Cambridge earns its living is considered later in this report.

Estimate of 1948 population

201 A reasonably accurate knowledge of population is necessary for the planning of every town. This is specially true of Cambridge, where big changes have taken place since 1939 and where population figures are complicated by the University. As existing counts were unsatisfactory, an estimate of mid-1948 population was made by the County Planning Department under the guidance of Mr. E. Grebenik, Secretary of the Population Investigation Committee.* The estimate is based on a 10 per cent. random sample of the reference leaves at the Food Offices, taken immediately after the annual exchange of ration books. Adjustments were made for undergraduates and residents in institutions. All population and density figures in this report are based on the results of the sample count, which included age, sex and postal address. The totals obtained were:—

Area	Population †	Range of Possible Error at 95% Confidence
The Borough	86,336	± 1,066
Outside the Borough ..	17,679	± 695
URBAN CAMBRIDGE ..	104,015	± 990

* The methods used in making this estimate and the results obtained are described in Supplementary Paper No. 1, of which copies are available in the County Planning Department.

† Including undergraduates but excluding young men away on military service.

Age and Sex Structure

202 Table 4A gives the age and sex structures of the 1948 population, excluding undergraduates. It shows that compared with England and Wales Urban Cambridge contains a low proportion of children under 15 and a high proportion of people over 45. This is no new feature of Cambridge's population: a study of 1931 Census figures shows that the excess of old people, taken proportionately, has declined between 1931 and 1948. A second marked feature of Cambridge population is the high proportion of women at all ages. (See Table 4B.)

Immigration

203 During the period 1931–48 net immigration accounted for by far the greater part of the increase of population in the Borough. It is estimated that natural increase amounted to slightly more than 500 people, net immigration to about 17,000. The calculations made indicate that the net immigration was heaviest in the age-groups 20 to 35. A projection of the 1948 population shows that the same trends are likely to continue. If there were no internal migration, the population of the Borough would increase by about 2,000 by 1968 and the whole of Urban Cambridge by about 1,500. Thus if there is any substantial increase in total population during that time, it will be almost entirely due to immigration.

2. DISTRIBUTION OF POPULATION IN URBAN CAMBRIDGE

Ribbon Development

204 Four-fifths of the population of Urban Cambridge live within the Borough, which is by no means fully built up. Of the villages outside the Borough, those near to the town and connected to it by main roads have tended to grow most rapidly, and are mainly inhabited by families who earn their living in the Borough. The growth between the wars of Girton, Shelford and Histon-Impington, and the ribbon development reaching out to them are an unfortunate example of haphazard expansion along lines of least resistance. It was easy to obtain access to an existing road or to buy land for one or a dozen houses near villages. The development of land in the Borough was not quite so easy. Much of it could be obtained only on lease and much of it was back land requiring access roads and some little capital expenditure before a return could be looked for. These were not very big hindrances to a more compact and orderly growth, but they were sufficient. With one gap the built-up area of Cambridge now extends, one ribbon wide at least, for 8½ miles from north to south. This is a tremendous and most wasteful straggle. In 1860 the built-up area of London was only 8½ miles from north to south. From every point of view —agriculture, convenience of inhabitants, economy of services, traffic and scenery—the expansion of a town by ribbon development and by haphazard additions to nearby villages is regrettable. We recommend that the Committee should refuse consent for all extensions of ribbon development, and also for the filling of gaps in existing ribbons, unless very strong reasons can be given for doing so.

Outlying villages

205 The villages farther away from the town, and those nearer in, which are relatively inaccessible, have largely retained their rural character. We recommend that, where further building is needed in villages round the Borough, it should comprise a careful infilling and rounding off and be limited in amount. Development in villages is further considered in paras. 256–261.

3. POPULATION DISTRIBUTION AND DENSITIES IN THE BOROUGH

206 Figures showing the density of population, in terms of people per acre, are a guide to the pleasantness and healthiness of residential districts, and show up some of the difficult problems that have to be solved by planning proposals, as well as the merits and failings of different solutions.

Gross density

207 Density is measured in a number of ways. *Gross Density* (population divided by total acreage) for the town and large subdivisions of it is a useful first test. The overall density of the Borough is now about 8.6 persons per acre. This is a low figure* for a town the size of Cambridge, but since the Borough boundary extends well out into agricultural land it gives only a very general picture. Map 24 shows the Borough divided into 15 sections (in *red*) for which gross densities, *exclusive of land still in agricultural use,* are set out in Table 5. These sections have been so drawn that each of those near the centre contains a fair share of the commons and other open spaces that are one of Cambridge's great assets. The gross densities of the sections—ranging down from 29 to 5 persons per acre—are also low by national standards for big towns, and show that high densities, if they exist at all in Cambridge, must lie within the comparatively small districts which are more or less solidly built over. Map 24 and Table 5 also show that the most populous districts are nearly all on the east side of the spine—the Huntingdon Road to Hills Road line. Four-fifths of the Borough population live east of the spine.

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* 1948 figures for some other towns are:—

	Population	*Acreage*	*Gross Density*
Oxford	105,150	8,438	12·5
Ipswich	102,100	8,746	11·7
Southport	85,800	9,538	8·9
Norwich	118,000	7,898	14·9
Bath	77,350	5,152	15·0
CAMBRIDGE	86,340	10,060	8·6

(Populations of towns other than Cambridge are from the Registrar-General's mid-1948 estimates. The figures for Oxford and Cambridge include undergraduates.)

Net residential densities

208 Net residential densities,* which show crowding or openness within individual residential districts or neighbourhoods, have been calculated for the 12 districts which are also shown on Map 24 (*black*, lettered A to L). These densities are set out in Table 6. The 12 districts include all those likely to have high net densities and a few others by way of contrast. The highest net densities are: —

District	*Persons per acre*
A. South of Magdalene	87.8
B. East Road (west)	81.8
C. New Town	78.9
ranging down to	
L. Grange Road	6.5

These densities include undergraduates and are therefore only valid for half the year in districts where there are many undergraduates.

209 Once again, these are not high figures compared with big towns, and the districts in which relatively high densities occur are mostly small. One can walk from the centre of the largest of them (East Road) to a big open space in six or seven minutes. But densities must be judged largely by local standards, for it is these that will control the forms of future development and redevelopment. The fact that Cambridge has high standards of space may make it more difficult and not less difficult to guide it in the way that is best for the town as a whole. Three factors in particular seem to us likely to influence decisions on future residential development.

210 The first is that Cambridge has hitherto been able to enjoy good small-town standards of space. Nearly everyone in Cambridge lives in a house, most people have gardens, allotments are numerous and popular, and open spaces are much used. Moreover, for 30 years virtually every new dwelling in Cambridge, whether built by the Borough or private enterprise, has been a house within a layout of low density. There is therefore what may be called a strong local tradition of openness in housing; and this must be taken into account in deciding whether Cambridge should change its views now that it is on the verge of becoming a big town.

211 Secondly, when all new dwellings were being built to low densities it was natural that districts with a (locally) high net density should be regarded with disfavour for reasons both good and bad. Most of these districts were Victorian speculations, to house the lower-middle and working classes. They were not very well built and were monotonously laid out. They were in fact built as " poor quarters " and have so remained. In the course of time buildings deteriorated; and as there has never been any shortage of land in Cambridge until now it was not worth while to rebuild them as modern dwellings.

The need for redevelopment

212 The third factor, and it is one of great significance, is that most buildings in Cambridge are the first buildings on their sites. The town has so far been able to evade that responsibility which nearly all large towns have had to face—namely *redevelopment*. The land available for building on the outskirts and the trend towards low density meant that houses in the central districts which could not command a reasonable or secure rent as dwellings were let go for other purposes—warehouses, workshops and the like. All higher-density districts in Cambridge are peppered with these non-residential uses which naturally reduce the pleasantness and value of neighbouring houses and tend to increase " blight." In Cambridge, as elsewhere, much dislike of higher-density districts arises from the association of these densities with monotonous layouts, neglected or derelict property and dwellings side by side with factories. There is, of course, no more necessity for these things to be present in a high-density district than in one of low density.

213 Cambridge has now reached the stage when extensive redevelopment cannot be postponed much longer. A fifth of all the dwellings in the town are coming to the end of their useful life—two-thirds of those in the East Road and New Town districts. What is going to happen in 10 or 15 years' time? One can see what has happened elsewhere, and how disastrous it can be to continue to build low-density suburbs—ever farther out—while an inner ring of older residential districts becomes steadily more dilapidated and derelict. If this process continues at Cambridge the old town and its ring of open spaces will soon be set in a half-circle of slum. On the other hand, that half-circle of inner residential districts could not be better placed for a redevelopment which could be in every sense profitable. It is near the Commons and on the main traffic routes, and surrounds the centre of gravity of the whole town.

Redevelopment Proposals

214 The central districts could be redeveloped in a number of different ways. For example they could, at least in theory, be wholly converted to non-residential uses, or used for low-density or high-density housing or for combinations of all three. In considering alternatives many different items have to be taken into the reckoning: the disadvantages of a sprawling town, the size of any overspill, the land available, the difficulties of reducing a high density to a low one, and the type and size of house likely to be needed in Cambridge. We have come to the conclusion that it would be unwise to extend the built-up area of Cambridge any more than is absolutely necessary. It is now about 2½ miles by road from the farthest suburbs

* Net residential density is the average number of persons per acre within an area used only for residence. Such an area comprises dwellings and their curtilages, internal access roads, minor open spaces used wholly or very largely by the inhabitants of the area, and half the width of boundary roads up to a maximum of 20 ft. Non-residential buildings, and buildings used at the same time for residence and some other purpose, are excluded, together with their inhabitants.

to the Town Centre and only the very strongest grounds would justify an increase in this distance for a town of 86,000, or even 100,000 inhabitants. Some extensions there must be in the next few years. Thereafter, the capacity of the older residential districts, when redeveloped, should be taken into account before further expansion is allowed. We propose to re-use most of the inner residential districts for dwellings, both because of their suitability and because the large amount of land which they contain would not be needed for other purposes unless Cambridge grew enormously.

Density Proposals

215 We recommend two standards of residential density: a low one (although a little higher than at present) in the outer districts and a relatively high one (much the same as those now existing) in the more central districts. We also suggest that, in broad terms, two-thirds of the dwellings on the outskirts should be suitable for larger families and two-thirds of those in the more central districts should be of smaller size. For many employed in the University, the Regional Centre and in businesses, for old people, families without children and those who do not want gardens, the convenience of being near the centre would outweigh the larger gardens of the suburbs. These recommendations do not run counter to the ideal that every residential district should contain different types of dwellings and both wealthier and poorer families. On the contrary, we think it would assist its realisation. Those old people to whom gardens and proximity to their grandchildren are of first importance could live farther out, and larger families who want only enough garden to be a scampering ground for the children could live nearer in. We have made some study of social groupings in Cambridge and it is the districts containing one type or size of house that are most lacking in the things that help to build up neighbourliness, and acquaintance between people of differing income. Ditton Fields, north Romsey Town, Queen Edith's Way–Hills Road, and Grange Road are all " one type " districts and are lacking in churches, clubs, shops, and small open spaces. With these the central districts are well supplied.

216 We are aware that a high proportion of Cambridge families with small incomes obtain most of their fruit and vegetables from their own gardens and allotments. But we do not think it possible to try to preserve this excellent side of Cambridge life for families in more central districts by giving each dwelling a sizeable garden. The best solution lies, as we see it, in providing more allotments as near in as possible. We hope that some of these could be found in the long-term reserve for the University in west Cambridge.

Size of Dwellings

217 The distribution and density of future population in the Borough are so closely bound up with size of dwellings that they must be examined together. For the next few years it may be best for the great majority of new dwellings to have five rooms* or more, for a five-room dwelling is proportionately cheaper to build than one of four or three rooms. But we do not believe that national resources during the next 20 years will allow of building large numbers of dwellings that are going to be under-occupied during most of their life; and this is what will happen in Cambridge if the great majority of new dwellings have five rooms and families do not continue to double-up or take in lodgers. By under-occupation we mean households of three persons or less in a five-room dwelling.

218 The present shortage of houses in Cambridge is well known. Over 3,500 applicants are now on the Borough waiting list, excluding all those now occupying a structurally separate dwelling—however small or tumbledown. Demand for Borough houses is proportionately greater than in some much larger towns. Yet it will be seen from Table 6 that on the average no district in Cambridge is overcrowded when tested by the standard of one person per habitable room; and this includes undergraduates and all children. There is certainly overcrowding by this standard in some houses within districts, but this is offset, statistically, by under-occupation of other houses. Of those areas studied the highest degree of occupation occurs in the inter-war Borough estate north of Romsey Town where there are, on the average, 0.8 persons per room.† According to the Housing Department it is probable that similar conditions exist in the other Borough estates. In the least crowded part of Cambridge, Grange Road, there are 0.5 persons per room, while averages of 0.6 are found in such widely differing areas as Old Romsey Town, Hills Road and Victoria Road. Wealthier people in Cambridge have at present much more garden space but the same number of rooms (though some of them may be larger) than their less-well-off fellow-citizens. We do not know the detailed distribution of under-occupation, on the basis of three persons or less in a five-room or larger house. We do know that there is little or no under-occupation of Borough houses and that under-occupation seems to be spread fairly evenly over all other houses.

219 By courtesy of the Borough we have been able to make some study of the sizes of Borough dwellings and of their occupancy. Of the 2,750 inter-war Borough dwellings 86% were of five rooms, 10% were smaller and 4% larger. Since the war 500 smaller houses and flats have been built, nearly half the total; and over half of these are of the temporary prefab. type. An examination of three older, well-established Borough estates shows that the average size of families (parents and unmarried children only) is 3.32 and the average number of occupants

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* Reference to rooms in this report means habitable rooms: which include any living room or bedroom of more than 50 sq. ft. and any kitchen where there is also a scullery. If there is no scullery, kitchens of over 90 sq. ft. are included. A habitable room of 50 sq. ft. would not be allowed in a new dwelling, but in order to compare existing and future accommodation it was necessary to work to a definition which did not exclude rooms in existing dwellings that were reasonably fit for occupation.

† This is less than the national average of 0.84 persons per room.

per house is 4.4. On one of the three estates occupation is as follows: —

Percentages of houses occupied as stated

1. A.	Single family* of three or less . .	24
B.	Single family of four or more . .	40
2.	One family, plus one or more lodgers	18
3.	Two families	16
4.	Two families, plus one or more lodgers	2
		100

This state of affairs cannot be called under-occupation of the estate as a whole, but it nevertheless shows a need for more small dwellings. One cannot say how much of the doubling-up is caused by tenants accommodating friends and relatives who have nowhere else to go, and how much by a need for extra money to pay the rent. The representations and correspondence in the press which accompanied the recent raising of Borough rents suggest that many tenants would prefer a smaller house at a lower rent.† We are also informed that it is comparatively easy to persuade a family in a Borough house to move to another house better suited to the size of the household if the new house is nearby, but that it is very difficult to do so if the move has to be to another district. We therefore recommend that each new Borough housing estate should contain, when completely developed, a large proportion of dwellings of less than five rooms and also some dwellings of every size.

220 It also seems probable that in the next 20 years there will be a large demand for smaller dwellings other than those built by the Borough. The town attracts an appreciable number of temporary residents who would often prefer smaller dwellings near the centre—for example, visiting professors, research workers and civil servants. Lower retiring ages, scarcity of domestic help and the high cost of gardeners are also likely to increase the demand for well-designed small dwellings.

221 More smaller dwellings can be provided either by new building or by the conversion of existing larger houses. (There are in the Borough 3,000 houses containing seven rooms or more.) We suggest that the Borough, as Housing Authority, should discuss with the principal private developers the ways in which public and private building programmes might be made complementary to one another. In this connection, the recent decline in the number of University lodging-houses, the difficulties of catering for undergraduates and the very high cost of extending College buildings, suggest that it might be worthwhile for the University or Colleges to erect a limited number of buildings which could serve more than one purpose. We have in mind buildings which, with little or no alteration, could be used as undergraduate sets for one or more Colleges or provide flats for University staff or the general public.

Densities in outer Residential Districts

222 The sites and layouts approved or approved in principle for recent Borough housing schemes have a net density of 10 or 11 houses to the acre, i.e. there are on the average 10 to 11 houses per acre on that part of the estate which comprises houses and gardens and access roads. Private enterprise proposals range from eight or nine houses per acre down to two or three. One cannot say what the net population density will be when these estates are occupied. On the present average for the Borough of 3.4 persons per dwelling (students excluded) densities would be about 36 persons per acre on Borough estates, and from 30 down to 10 or less on private estates. We believe that if a large extension of the built-up area is to be avoided and high standards are to be maintained in open spaces and school playing-fields, it will be necessary for land on the edge of the built-up area to be rather more fully used than in the past. This would not be a case of a sacrifice without compensation but rather of an exchange of one amenity for another. Cambridge is well supplied with open spaces, as is shown in Table 7. In order to retain and even add to these, to keep daily journeys reasonably short and to provide local shopping centres, well-placed schools and other advantages, both the garden space and the distances between houses would be slightly reduced. We recommend that between a quarter and a third of each Borough housing site should be set aside for schools, shops and other communal uses, and that the rest—the net residential area—should be laid out to accommodate, on the average, 40 persons per acre. This would mean an average of 12–13 dwellings per acre, assuming three or occasionally four persons per dwelling.

223 We also suggest that the Committee should encourage some increased density on private estates. We believe that even in Cambridge there are an appreciable number of people who do not want large gardens, and that private estates which offer a choice of sizes of plot, ranging from 12 up to five to the acre, are likely to meet public demand better than those in which the plots are all the same size. We also believe that there would be a considerable demand for new and conveniently designed flats. This recommendation, if accepted, would make a great difference to development in west Cambridge, where before the war leasehold covenants usually restricted building development to single-family houses containing 2,000 to 3,000 sq. ft. of floorspace on plots of from half an acre to one acre. We think these covenants are out of step with the times. Nowadays few people—and certainly very few dons—would be able to build and maintain such large houses to the standards intended by the covenants.

Densities in Central Districts

224 We recommend that most of the land in central residential districts should continue to be used for dwellings, and should be redeveloped by stages with modern dwellings at densities ranging from 75 to 50 persons *per*

* Parents and unmarried children only.

† In 1947, when sharing of houses was abnormally high, only 13% of households throughout the country contained five persons, but 28% of houses contained five rooms.

acre, i.e. between 25 and 18 dwellings, per acre. We propose that the density for particular districts should be determined according to layout possibilities and their suitability for particular kinds of development, such as middle-income flats, University lodging houses, Borough houses or combinations of these types.

Total population

225 The total population that could be accommodated within the Provisional Boundary (see Maps 31 and 32) if these recommendations are accepted is about 100,000, or just over 90,000 excluding undergraduates and residents in non-University institutions; and this would not require any great change in the existing character of the town. We are, however, aware that density of population in any district can only be determined by planning methods within certain limits. Collaboration between the Committee and the Borough, and knowledge of household structure and size, will suggest the right sizes of houses to be built, but if public opinion will not accept increases in residential density, the built-up area will have to expand. We believe that most people will accept the small increase we propose, but this will not be finally decided until the first houses are built and occupied: and acceptance will largely turn on their standards of layout and design. Secondly, if, as we later propose, a policy of trying to fix an upper limit of population for Urban Cambridge is accepted and acted upon, there may come a time when planning permission for building additional houses in Cambridge will have to be refused. The results of such a refusal cannot be forecast until much nearer the event; probably the first quinquennial review of the Development Plan called for under the 1947 Act will be a suitable time, i.e. in about six years from now. One of the possibilities is clearly that under-occupation of dwellings might be succeeded by overcrowding.

HOUSING

I. CONDITION OF DWELLINGS IN THE BOROUGH

226 Map 25 gives a generalised picture of the condition of dwellings in the Borough. The map is based on the results of a detailed survey which took account of age, structural condition, sanitation and environment.* Dwellings have been placed in four classes: *Good, Below Standard, Short Life* and *No Life.* Broadly speaking, buildings in the two lower classes (shown by *black hatching* and in *solid black* on Map 25), are those which could not be brought up to the *Good* standard by a reasonable expenditure on repairs and improvements.

227 In March 1949 dwellings were divided among the four classes as follows: —

Class	Number	Percentage
1. *Good* . . .	13,023	58
2. *Below Standard* † .	4,913	22
3. *Short Life* . .	3,266	14
4. *No Life* . . .	1,428	6
	22,630‡	100

Figures for the districts which contain the majority of 3rd and 4th Class dwellings are set out in Table 8.

228 With only a fifth of the houses in the two lower classes the condition of Cambridge dwellings—taken as a whole—compares favourably with those in many other towns. In the East Road district, however, nearly two-thirds of the dwellings are in the two lower classes, and in New Town over half. Map 25 shows that East Road is the district that most needs redevelopment, both for the number and close spacing of dilapidated dwellings. There is in fact no other large area in the town of almost continuous dilapidation. In New Town there is a concentration of dilapidated property, but it is a much smaller area. There is also a high proportion, though a small number, of 3rd and 4th Class dwellings near Park St., on Castle Hill and in Old Chesterton, and there is a liberal sprinkling of 3rd Class dwellings near Victoria Road and in Romsey Town.

Demolition of unfit dwellings

229 The 1,400 4th Class dwellings may very reasonably be called unfit for human occupation, but it would be unrealistic to expect that they can soon be pulled down and rebuilt or replaced. In the next section of this report we suggest that it may take nearly 10 years to provide houses for families now on the Borough waiting list who are not occupying a structurally separate dwelling of some kind. This takes no account of the pressure of immigration into Cambridge. Although the Borough's post-war housing output has been high, additions to the waiting list (after vetting and allowance for people dropping out) are still being made at a faster rate than new houses are being built. Under these circumstances the Borough could hardly contemplate immediate and extensive clearance of 4th Class dwellings.

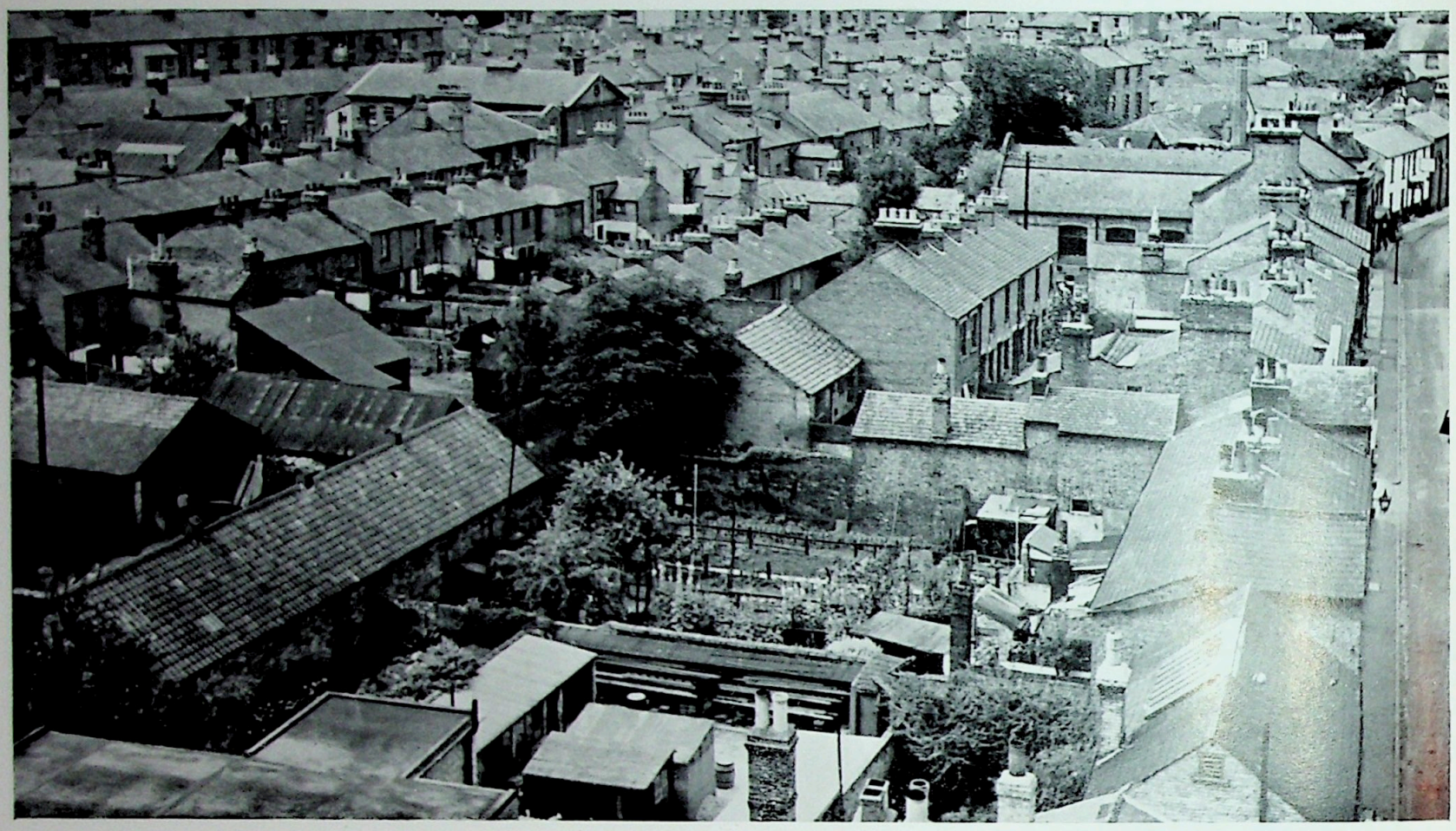
230 We do, however, feel very strongly that the needs and difficulties of the moment should not be allowed to postpone a minimum programme of works necessary for the future of the town. If, to take a pessimistic view, the rate of immigration increases and the Borough population

* We are much indebted to officials of the Borough for information on housing and assistance in the survey of condition. The method of survey and assessment by a pointing system are described in Supplementary Paper No. 2, available in the County Planning Department.

† Including 350 temporary prefabricated bungalows and certain other temporary dwellings which have been included in this category because of their limited life.

‡ This compares with the 23,000 residential hereditaments in the lists of the Borough rating officer. The discrepancy is partly attributable to certain Class 1 buildings being sub-divided for rating purposes.

INNER RESIDENTIAL DISTRICTS.
Top : York Street, looking north. *Below :* Burleigh Place, off East Road.



INNER RESIDENTIAL DISTRICTS AND THE CENTRE.

Top : New Town, looking west from St. Paul's Church.

Centre : St. Peter's from the cleared land near Northampton Street.

Left : the site of the proposed Guildhall Street ; Lion Yard looking north towards Petty Cury.

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grows quickly, the road improvements proposed earlier in this report will be much more necessary in 1960 than they are now; and if in the coming 10 years, under the stress of an ever-present housing shortage, the making of improvements and clearances needed for them have all been postponed, the outlook for Cambridge will be very black. We therefore recommend that clearance of dilapidated dwellings should begin in 1951 and should continue steadily thereafter whatever the housing shortage may be. But because of that shortage we propose that clearance should be restricted to buildings within certain areas, and that subject to a minimum of progress in each year, the rate of clearance should be dependent on housing progress.

231 Our proposals for clearances are set out in Table 9. It will be seen that we propose a departure from the normal procedure. We recommend that for the next 13 years only those houses should be cleared which are either in the way of road improvements proposed for execution before 1963, or of the limited redevelopment scheme in the East Road district which we think could also be carried out in the same period. We suggest that all other houses should be left standing unless they become structurally dangerous or dangerous to health. To follow the usual procedure and to demolish unfit houses in order of badness in ones and twos all over the town would bring advantage only to the comparatively small number of families rehoused, and would leave a comparatively large amount of land idle for years because it would be broken up into scattered plots each too small to be redeveloped in accordance with an improved layout plan. Some plots of this kind may be seen now in the Castle Hill and East Road districts and elsewhere. To concentrate clearance within road improvement areas and the East Road redevelopment site would, on the other hand, rehouse people from dwellings which are nearly as bad as any others, make appreciable progress on main road improvements, and enable more families to be housed on the first redevelopment site than are there now. In brief, the proposed procedure would kill three birds with one stone.

232 If this recommendation is acted on, about 1,200 4th Class dwellings would be left standing for another 13 or 14 years. We suggest that the Borough should try to acquire all these buildings. This would place most of the worst-housed families in Cambridge in the care of the Housing Committee and its officers, and would enable the 4th Class dwellings to be used as part of the housing pool—chiefly one hopes for smaller families and for fairly short periods. Normally it would be uneconomic to spend anything on repairing these houses, but we think it would be worth while to do so under present conditions. The work of cleaning the dwellings, making them weather-tight and providing a minimum of sanitation, could be done by builders in a small way of business who could not easily take part in the Borough's main building programme. If the housing shortage ends more quickly than can be expected at present the money will not have been wasted. It will have improved the lot of more than 2,000 people for several years and will enable the best of the houses to be kept in use for some further years as half way accommodation for those "problem families" which form a small proportion of local authority tenants.

2. CONDITION OF HOUSES OUTSIDE THE BOROUGH

233 The assessment of condition of dwellings for the portion of Urban Cambridge outside the Borough has not yet been completed. The work will be carried out village by village by the County Planning Department in collaboration with the Chesterton Rural District and representatives of the villages. This part of the survey is of special significance in that many picturesque cottages are damp and defective in sanitation, and an accurate picture of present conditions will be valuable in deciding how the provision of healthy accommodation can best be reconciled with preservation of buildings of architectural value and with a moderate expenditure on repairs and improvements.

234 We think it right to regard the housing problem of Urban Cambridge as one problem having an urban and a rural side to it. Collaboration is needed between the two housing authorities as regards applicants for houses, and to decide the extent to which the villages may be dormitories for people who work in the town without jeopardising the prior claims of rural workers and the social life and traditional form of the villages.

3. HOUSING DEMAND

235 The problems of housing demand and provision are probably the most difficult of those with which local authorities are now grappling. Demand for accommodation in Cambridge is proportionately greater than in most other towns because of war-time immigration, the lodging requirements of the University and certain short-term requirements such as those of married undergraduates. Moreover immigration into Cambridge did not stop at the end of the war, and its continuance has made it more difficult to allot new houses fairly, and almost impossible to estimate the Borough's total requirements.

236 It is, however, useless to attempt a plan for Cambridge, even in the broadest sense of achieving a fair division of land between different uses, unless one can form a reasonably accurate idea of future population. We feel that the only way to do this at present is to try and decide how many people could be accommodated in Urban Cambridge without appreciable change in the character of the town and neighbouring villages and countryside. We estimate that about 100,000 people could be accommodated in the Borough and a total of, say, 110,000–125,000 in Urban Cambridge. Later in this report we recommend that a vigorous effort should be made to limit population to these figures within these boundaries. As a first step we propose that a distinction should be made between present and future housing

demand: that is, between the needs of people now living or working in Urban Cambridge and those of future immigrants. We propose that the list of applicants for houses in the Borough and Chesterton Rural District should be divided into " A " and " B " Lists, the former containing applicants living or working in Cambridge before a certain date—say, 30th June, 1949—the " B " List comprising later immigrants. The " A " List would not contain the names of all those needing a house who were living or working in the district before the 30th June, nor would the "B" list contain all immigrants. Nevertheless the Lists would give at any time the ratio of new to old applicants for local authority houses and act as a barometer of immigration pressure. In addition information on immigration can in future be obtained from the Registrar-General's quarterly returns, based on ration-book exchanges. This information has not been available in consistent form for periods before January, 1948.

*Demand in the Borough**

237 In the years 1921 to 1940 the Borough built 2,643 dwellings and private enterprise 4,574 within the Borough area. Since the war, up to July 1949, the Borough has provided about 1,300 new dwellings (including about 350 temporary prefabs)—a very considerable achievement. About 150 houses have also been built by private enterprise.

238 The number of applicants on the Borough waiting list has fluctuated. It was 3,000 in December, 1945, and rose to nearly 5,500 in November, 1948. Since then, chiefly as a result of close scrutiny of applications, it has fallen to 4,778 at the end of June, 1949. Of these 1,074 were living in structurally separate accommodation of some kind, usually of bad quality. In round figures, therefore, the minimum " A " List demand for Borough dwellings, at June 30th, 1949, may be taken as 3,750. When this number of additional new dwellings has been built, the Borough will still have to provide for the replacement of about 1,200 4th Class dwellings (i.e. 1,428 less the 235 that will be replaced before 1962. See Tables 8 and 9), in addition to the responsibilities it may undertake for housing those on the " B " List.

239 It is not possible to forecast " B " List demand, that is, demand from those who began to live or work in Cambridge after 30th June last year. This is more or less directly dependent on the number of new jobs offered in the Cambridge district. In the earlier part of 1949 applications for Borough houses were being made at the rate of about 1,200 a year and of these about 900 a year are " genuine " and remain on the list. From what can be learnt from the Housing List only a proportion of applicants are recent immigrants, but there is no means of being certain what this proportion is. Figures for *net* immigration into Cambridge in the last few years are unsatisfactory. One can only say that it seems that since the beginning of 1948 net immigration into Urban Cambridge has been at the rate of 1,100–1,200 persons per year, and that the corresponding figures for the Borough only are 700–800. (Registrar-General's Estimate from exchange of ration cards.) If these estimates are correct immigration at the present rate might result in 250–275 new applications for Borough houses each year. There is thus, even five years after the war, a considerable difference between the total of recent new applications for Borough houses, at the rate of about 900 houses per year, and the proportion of these applications that can with certainty be attributed to immigrants—250–275 a year. Much of the difference is probably attributable to recent marriages, to people who have despaired of getting a house by any other means and people who, although unsatisfactorily housed, have not bothered to apply earlier.

240 A random sample of 200 Borough applications shows that the average size of applicants' families (parents and unmarried children) is 2.5 persons, divided as follows:—

Number in family	*Percentage of all families*
1 or 2	59
3	23
4	12
5	4
6	1
7 or more	1
	100

Applicants are often engaged or newly married and the size of their families will probably grow. The " A " List demand for Borough dwellings may, therefore, be taken as 3,750, to house between 9,000 and 13,000 people.

241 The " A " List demand for non-Borough dwellings can only be guessed at. We have assumed that 500 people, not already occupying an unfurnished house or flat, would both like such a dwelling and be able to afford one at present prices if they obtained a building licence. Thus the minimum " A " List demand—minimum in the sense that it makes no provision for people in bad houses or who want more convenient ones—is for about 3,750 Borough dwellings and 500 others. Will this demand shrink appreciably in the next few years? The 450 married undergraduates will probably drop to 50 or 100, and perhaps 500 other families may leave—some of them being on the " A " List and some leaving dwellings that will be occupied by " A " List families. We have assumed that immigration will not reduce the " A " List to less than 3,500 for Borough dwellings and 400 for other dwellings.

Demand outside the Borough

242 The total number of applicants on the Chesterton Rural District list for houses in villages in Urban Cambridge was 717 in June last year. Of these about 50 were

* The data and assumptions, on which the calculation of housing demand within the Borough is based, are summarised in paragraph 262.

in structurally separate houses of some kind (not necessarily in the villages in which they wished to live). Of these 717 applicants, 565 were in non-agricultural employment, but all had been checked against the Borough list, and applicants not working in the Rural District are not placed on the list unless they have a social connection that is likely to last with the village in which they wish to live. Excluding temporary conversions, about 140 houses have been built in Urban Cambridge since the war by Chesterton Rural District and 23 by private enterprise. Demand for private enterprise houses in Urban Cambridge outside the Borough cannot well be distinguished from the similar demand inside the Borough, but we have assumed a demand for 100 such houses by families not already occupying a separate dwelling.

243 The " A " List demand for houses in Urban Cambridge and outside the Borough may, therefore, be put at 675 for Chesterton Rural District houses and 100 for private enterprise. These figures are so small compared with those in the Borough that no reduction has been made for emigration.

4. HOUSING PROGRAMME IN THE BOROUGH

Houses on new land

244 We have considered a possible housing programme in the Borough, in terms of land needed, for the period up to the end of 1962—that is, for the period covered by the first two stages (1951–55 and 1956–62) of the road improvement programme described in our first chapter. In order to arrive at the number of houses likely to be needed on new land in this period the figures given in paragraph 241 need two adjustments.

245 A certain number must be added to provide, first, for families now in structurally separate dwellings who will be displaced by road improvements and other clearances and will not be rehoused on cleared sites; and secondly, for some " B " List families, since immigration is unlikely to come to a complete stop for some years. We have assumed that 600 houses should be added for these reasons—making the Borough programme 3,900 houses and that of private enterprise 600.

246 Some of these dwellings will, however, be provided by the conversion of larger existing houses. There are 3,000 houses in the Borough with seven rooms or more and 1,100 with nine rooms or more. When houses in use as University lodgings, guest houses and offices have been allowed for, it does not seem likely that conversion will make a large contribution to additional dwellings before 1962. We have assumed that by this means the Borough programme will be reduced by 150 and other demands by 100. Our final programme for dwellings on new land in the period 1949–62 thus becomes: —

By the Borough . . .	3,750
By private enterprise . .	500
	4,250

247 Between 1920 and 1940 new dwellings were built in the Borough at an average rate of 360 a year, the peak output being 653. The Borough expects to complete about 450 dwellings in the year ending March 31st, 1950, and probably 20 or 30 private enterprise houses will also be completed. It may be that Cambridge will be able to build more than 450 houses a year, but we think it would be unwise to count on it. It may well be that 350 houses a year will prove the correct figure. At 450 dwellings a year our programme, which does not include for rehousing more than a handful of the 1,400 households now living in 4th Class houses, would take nine years to complete; and this programme, it will be remembered, is almost wholly to meet the needs of people already living or working in Cambridge.

248 It will be noticed that the programme provides for a low proportion of private enterprise building—1 in 7, compared with the 1 in 5 ratio now permitted but not being built, and with the 2 to 1 ratio of the inter-war years. The programme is based on demand estimated in the manner described in preceding paragraphs. We may have under-estimated the number of people now in Cambridge who would be ready to build their own houses at current prices. It is almost certain that if private enterprise could offer new houses at rents anywhere near those of the Borough there would be a large demand for them, and that they would attract many of those now awaiting Borough houses. As regards output and location of houses up to 1962, we do not think our programme would be much affected by a change in the ratio of Borough to private enterprise dwellings. Public interest in any such change would be mainly centred on the question of who was to occupy the houses.

Siting of new houses

249 Our proposals for the siting of these houses on new land are set out in Table 10 and on Map 33. We include all the Borough housing sites which were not occupied by the end of June, 1949. All the sites lie within the Provisional Boundary—the line beyond which we propose that building development should not be allowed except in few and special circumstances. It will be seen that the sites proposed are large enough to accommodate, at the densities we recommend, rather more than the 4,250 dwellings in our minimum programme. A total of 4,553 dwellings could be placed on them.

250 During the next few years a high proportion of all new dwellings in Cambridge will be built by the Borough and this lays a heavy responsibility on the Borough Housing Committee and its officers as regards layout and design. We have visited post-war Borough estates and we feel that the main defect to be averted is monotony of appearance resulting from the use of too many building units of the same size and kind. This is, of course, a failing which occurs in a multitude of estates both local authority and private, and it is one that has been much studied during the last few years. The remedy lies partly in preserving existing trees and hedges and in new planting, but chiefly in including large and small houses on

every estate and also different forms of building—terrace houses, old people's bungalows, and three- or four-floored flats, as well as detached and semi-detached houses. Housing estates of this kind need no longer be described in words, as they can now be visited in various parts of the country. The preparation of a layout plan providing for this variety of buildings will not prevent the erection, as a first stage, of the buildings which are easiest and most economical to build, and will safeguard the estate's final form. We show in Map 26 a sample layout for an area on either side of Queen Edith's Way that provides the variety of street scene and building type which we have in mind. This layout is not based on ownerships, but serves as a sample area to which these standards could be actually applied.

Redevelopment

251 Unless larger resources can be devoted to house building than seems probable at present, it will take 10 years to build the houses provided for in Table 10. By that time up to 2,000 houses in the more central districts will have become due for redevelopment in a manner worthy of their position near the Commons and adjoining main traffic routes. From then on, it should be possible to provide by redevelopment all the new dwellings needed —preferably in the central districts, and failing that by redevelopment of the sites of houses which are too large for modern needs.

252 We propose that before 1963 two sites in the East Road district should be redeveloped. These are shown on Map 27. Together they comprise 8¾ acres and now contain 128 dwellings. Redevelopment in the manner shown in Map 27 would provide 145 dwellings, 90 being flats and 55 houses. The suggested layout—which again shows an application of method rather than a detailed building programme—provides several small open spaces and a reasonably high standard of privacy.

253 We suggest that after 1962 work on redevelopment should continue to be concentrated in the East Road district until substantial progress has been made. The district (see Areas B and D on Map 24) contains 46% of all the 4th Class, and 43% of all the 3rd Class dwellings in the town, and great advantages can be obtained from a steady programme of work in one area. Thereafter, we propose that attention should be given to Castle Hill, New Town and the Park St. area, in that order.

254 Regarded solely as a local authority housing project, governed by normal housing finance, redevelopment of central residential districts would be slower and more costly than building on new land farther out. But one of the chief aims of the Town and Country Planning Act, 1947, is to make it unnecessary to take too narrow a view of redevelopment which is needed for the future well-being of a town. We recommend that the East Road district, when redeveloped, should be used partly for dwellings and partly for other purposes—including larger shops and offices—and that the houses and flats should be of kinds that would attract occupants of every level of income. The land uses proposed for the district are shown in Map 33. In comprehensive redevelopment of this kind, aided by grants under the 1947 Act, new Borough dwellings for families of low income would form only one element, and the least profitable.

255 We propose that when they are fully redeveloped a somewhat smaller portion of the central districts than at present should be used for dwellings. This would mean that eventually these districts might contain up to 7,500 fewer residents, excluding undergraduates. An overspill of this size might require 200–250 acres of additional new land to be brought into use for housing. The land can be found, but we think it would be unrealistic to consider suitable sites in detail so far ahead of the event.* The dominant housing questions at Cambridge are, first, the siting and building of houses for the long-suffering citizens on the " A " List, and, secondly, that of immigration.

5. DEVELOPMENT OUTSIDE THE BOROUGH

256 We have stated that the " A " List programme for house building in the portion of Urban Cambridge lying outside the Borough may be taken to comprise 675 local authority houses and 100 others. Chesterton Rural District expects to complete 60 houses in Urban Cambridge in the year ending March 1950 and about 20 private enterprise houses will probably be completed in the same year. The comparatively large number of private enterprise houses is due partly to building delays and partly to the high proportion of Chesterton Rural District Council's quota of private houses that will be built in the villages around Cambridge.

257 The collection of survey information for villages around Cambridge, including land use and age and condition of buildings, has not yet been completed, and we are therefore unable to include in this report detailed recommendations concerning development in the various villages. We are, however, convinced that careful guidance of development outside the Borough is an essential part of the planning of Urban Cambridge.

258 Settlements outside the Borough may be broadly divided into the free-standing villages—such as Barton, Madingley and Teversham—and the larger and more complex settlements linked or almost linked to the town by continuous ribbon development—such as Girton and the Shelfords. In both cases we recommend that a provisional boundary should be laid down around the settlement, beyond which development would not normally be permitted, and that further building development should comprise a careful infilling and rounding off of the village. The production of a satisfactory development plan of this kind for the detached villages should not present any great difficulties. The County Planning Department is benefiting greatly in its collection of survey information from the help of parish groups, containing representatives of the Parish Councils and other interested residents.

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* Overspill for the present population would become a very small matter if Cambridge were to follow the unhappy precedent set by its sister University town. Oxford increased its population by 43% in the 18 years between 1921 and 1939.

The Department intends to ask for the comments of these groups on the development plans for the various villages while they are still in their first sketch form and we think this procedure is particularly suitable for the planning of communities where residents have a keen interest in and precise knowledge of all land and buildings.

259 Map 28 shows the type of development plan we have in mind for settlements outside the Borough. Milton is just outside the built-up area of the Borough, from which it is separated by the sewage farm and the Ministry of Supply storage depot on either side of the Ely Road (A10). A number of things make the preparation of a development plan for Milton one of some difficulty. These include the taking over of Milton Hall as the Sub-Area headquarters of the Eastern Electricity Board and their need for houses and offices, the mineral workings, the high water table, and the need to straighten Trunk Road A10 as it passes through the village. The plan provides for moving the village " centre " a little away from the main road, for a new hall and school, and for about 200 additional houses.

260 The complex settlements around the Borough comprise Girton, Histon-Impington, and the Shelfords; Cherry Hinton in the Borough and Trumpington-Grantchester astride the boundary are somewhat similar in character. We recommend that development plans for these settlements should preserve open space between them and Cambridge, prevent any extension of ribbon development, and encourage the establishment of a village centre in each settlement—including shops, other community buildings and a bus lay-by or turn-round.

261 The total amount of new development which could take place outside the Borough without detriment to individual villages cannot be determined until outline development plans are available for the various villages. In general, we think it desirable that the great majority of new building development in Urban Cambridge should take place in the Borough, and that no great increase should be allowed in the free-standing villages which still retain their rural character. We have assumed that the increase of population in Urban Cambridge outside the Borough will be between 10,000 and 25,000.

6. BOROUGH HOUSING DEMAND AND PROGRAMME: SUMMARY OF DATA AND ASSUMPTIONS

262 The figures and assumptions in paragraphs 235–255 concerning housing demand and the housing programme in the Borough may be summarised as follows:—

BOROUGH HOUSING DEMAND AND PROGRAMME

DATA	Dwellings or Plots		Reference	
		Totals	Para.	Table
I—HOUSING LIST, June 1949, checked	4,778		238	
Made up of :—				
(i) Applicants in lodgings, etc.	3,704			
(ii) Applicants in structurally separate dwellings	1,074			
" A " list or 1st Priority ∴ taken as		3,750		
II—Rate of growth of Housing List in 1949. True proportion of immigrants included in this figure unknown	900 per year		239	
III—Net Immigration 1948, 7–800 persons	250–275		239	
IV—HOUSING CONDITION SURVEY—				
4th Class (No Life)	1,428			8
3rd Class (Short Life)	3,266			
V—Recommended for Demolition pre-1962—				
4th Class	235		231–232	9
3rd Class	156			
Recommended Redevelopment	145		252	
∴ No. to be added to demand for housing on new land		246		

(*Contd.*)

ASSUMPTIONS AND PROGRAMME	Totals		Reference	
	Borough	Private Enterprise	Para.	Table
VI—CALCULATION of 1st PRIORITY or "A" LIST HOUSING requiring new land—				
(*a*) Round Figures from Housing List (I) and demand for Licences ..	3,750	500	241	
(*b*) Wastage	−250	100	241	
(*c*) Surplus Demolitions over Redevelopment 246 (V above), plus 354 "B" List or 2nd Priority upgraded	400	200	245	
(*d*) Conversion of Large Houses to Flats	−150	−100	246	
	3,750	500		
VII—NEW SITES made AVAILABLE to meet 1st Priority	4,553 plots		249	10
Infilling plots available—more than	150 plots			
	4,703+ plots			
	Total Plots or Houses			
VIII—Calculation of Minimum 2nd Priority Housing: post-1962				
(*a*) Outstanding 4th Class Housing for replacement (1,428 − 235), (V above)	1,193		238	8 and 9
(*b*) Outstanding 3rd Class Housing for replacement (3,266 − 156), (V above)	3,110			8 and 9
(*c*) Residue of June 1949, applicants in structurally separate dwellings (VI (*c*) above) 1,074 − 354 = 720. These applicants are mostly in 3rd and 4th Class Housing and are therefore accounted for in (*a*) and (*b*) above—				
Therefore say	100			
	4,403			
(*d*) At least 50% of these 4,403 dwellings will be provided for in the redevelopment of existing sites	−2,203			
∴ Number of fresh sites to be found after 1962	2,200			
(i) Houses to take the natural increase of families (Population nearly static but an ageing structure)	??			
(ii) Immigrant Families arrived since June 1949	??			
IX—New Land suggested for Development as necessary after 1962			255	
(*a*) The 450 plots left over from 1st Priority Housing				
(*b*) Arbury Road to North Bypass				
(*c*) Between Long Road and Trumpington				

LIVELIHOOD

263 In the last thirty years, and especially during the last decade, there has been a big change in the way Cambridge earns its living. Up to 1914 it was a University and market town and a railway centre, and not very much else. Today it is, in addition, a considerable manufacturing town and a Regional Headquarters for central government. The development of motor bus services in the region and the prosperity of agriculture also enable inhabitants of country districts to visit the town much more frequently than they did before the war. Broadly speaking, one may say that up to 1914 the growth of Cambridge was determined by the growth of the University. This is no longer so. Only about six per cent. of the working population of the Cambridge district is now employed by the University and Colleges. The rate at which Cambridge grows in future will be determined by the new jobs offered in commerce, manufacturing and service industries, and in central and local government.

1931 *and* 1948

264 Very considerable research and calculation would be needed to compare the ways in which Cambridge earned its living in 1921 and 1948; but we have been able to make a broad comparison between 1931 and 1948 for an area a little larger than Urban Cambridge.* Table 11 shows that the population of the three Employment Exchange Areas is somewhat greater than that of Urban Cambridge—128,000 compared with 104,000—and that the working population of the three Areas is 56,000. The comparison between employment in 1931 and 1948 is set out in Table 12 and in chart form in Diagram 29.

265 The main interest of the chart is in the picture it gives of the expansion and contraction of different employments between 1931 and 1948. The biggest growths are in central government and the manufacturing industries. Central government employment has grown by 350 per cent. and central and local government, taken together, now employ nearly twice as many as the University and Colleges. All manufacturing industries together have grown by 40 per cent., and the five manufacturing industry groups that have grown most have increased their employment by about 4,000—a 180 per cent. increase. The *growth* of employment in these five groups was therefore greater than the total number of people now employed by the University and Colleges.

266 The comparison for University and College employment—the most important industry in Cambridge from the national point of view—is unfortunately less reliable than those for other employments. The number of full-time graduate teaching and administrative staff employed by the University and the Colleges (or holding appointments with both) rose from about 600 in 1931 to 800 in 1948. University assistant staff have more than doubled in numbers, from 500 to 1,100. College servants numbered 1,600 (full- and part-time) in 1948, but we have been unable to discover their number in 1931. Although those engaged in domestic service in the town as a whole have decreased by a third since that date, the increased numbers of students now in Cambridge makes it probable that the decrease has been chiefly in private service, not in college servants. We have therefore assumed the same number in 1931 as in 1948. We estimate that University and College employment has increased by about 850 since 1931, from 2,750 to 3,600, an increase of 31%.†

267 By far the greatest fall in employment has been in personal service (3,000), the only other of consequence being in the manufacture of clothing.

268 These changes are comparatively large. Their main causes appear to have been the large expansion during the war of firms manufacturing important war equipment and the subsequent retention of many of the employees; and secondly, the establishment of the government Regional Centre. Some of the new recruits to these employments were local people but many were war-time immigrants. As has been mentioned previously, the population of Urban Cambridge grew by about 16 per cent. between 1937 and 1948. The changes in employment and growth of population can be looked at in many different ways. We think the Committee will be concerned mainly with the answers to three questions: whether the changes have been advantageous from a social point of view for Urban Cambridge as a whole, so far as they have gone; whether expansion is likely to continue; and if so whether it is likely to be beneficial.

269 There is no single answer to the question whether the changes since 1931 have been for the better. Employment is more evenly spread between industries and there are more industries employing large numbers. Twelve employed more than 1,500 in 1948 compared with seven in 1931. The decline in personal service points to a higher money income for employees. Unemployment has never been severe in Cambridge. Probably this has been due, to quite a large extent, to the buttressing effect of University and College employment, direct and indirect. Unemployment was about 2 per cent. in 1931 and today is virtually *nil*, and there are 1,800 vacant jobs on the books of the three Exchanges. It can be maintained that, on the whole, security has been increased by the expansion of employment, which has included many jobs in central and local government and in industries which are tending to go ahead—chemicals, wireless and television and scientific instruments. It can also be maintained, though on grounds which are more open to

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* This comparison is between (1) the industry tables of the 1931 Census for Cambridge M.B., Chesterton R.D. and Linton R.D. (as then constituted) and (2) the National Insurance cards issued in July 1948 in the Cambridge, Cottenham and Sawston Employment Exchange Areas. The two sets of figures relate to approximately the same area and although the first relates to place of residence of employed and the second to place of work, such is the predominance of Cambridge as an employment centre, that a comparison gives a good indication of the trends of local industries.

† We are indebted to University and College officials for their assistance in making these estimates.

dispute, that the new employment pattern offers young people more opportunity of acquiring skill and social promotion. Thus, against considerable local advantages, the average Cambridge employee can only set disadvantages which are prevalent everywhere—the housing shortage, high cost of living and slow improvement in service industries.

270 Employers see things differently. For them the labour shortage has added very greatly to the difficulties of the post-war changeover and those in charge of the bigger employments would be more than human if they did not sometimes regard each other unfavourably. The "old" employers resent the "new," and all others resent the Regional Centre. We have examined jobs on offer at the three Exchanges and these, set out in Table 13, show clearly the tug-of-war that is going on between the service industries, the other older industries and those which have recently expanded.

271 The outcome of this competition and attempt to attract more workers to Cambridge is obviously of crucial importance to the planning of the town. If Cambridge were going to grow no bigger than it is now, or would be if the 1,800 existing vacancies were filled, there would be nothing very alarming about its size. The 4,500 dwellings on new land and the 100 or 200 other buildings needed could be fitted in without any great change of character or loss of many pre-war advantages. There is, however, no certainty whatever that growth will not continue. All the big employers have a strong case for seeking more employees. The government is urging the University to expand; the service industries must serve a prosperous agriculture efficiently and do what they can towards attracting tourists; both older manufacturers and the new earn dollars and hope to earn more;* and central and local government must try to attract the staff to enable them to cope with many new duties. We believe that it is very likely, unless preventive measures can be agreed and carried out, that Cambridge will grow rapidly, and that if this happens the average citizen of Cambridge will gain nothing and lose a great deal.

FUTURE SIZE

272 It is impossible to make a good expanding plan for Cambridge. A plan can be prepared for a population rising to about 100,000 in the Borough (120,000 to 125,000 in Urban Cambridge) which would keep nearly all of the present advantages and qualities of the town and its surroundings. But if population is going to grow to much more than this—to, say, 175,000 or 200,000 in Urban Cambridge—quite a different plan would be needed, involving big changes.

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* Moreover, it is quite possible that if the economic situation becomes worse the Government might seek to remove all hindrances whatsoever in the way of the expansion of dollar-earning manufacturers, wherever the factories were situated.

The Attractions of Cambridge

273 We have said that we think it very likely that Cambridge will grow quickly unless active measures stop this happening. Our main reasons for this belief are:—

(i) The town's attractions as a centre for modern scientific industries. There has been a large expansion of several firms of this kind during the last decade. The car-building industry is sometimes said to have grown to large size at Oxford before its stature was noticed. Much the same thing might happen at Cambridge, which already possesses two or three industries which might grow very quickly indeed.

(ii) Its attraction for manufacturing firms seeking to evade the Barlow ban on the setting up of new industries in the London area. This attraction has already shown itself to be in force.

(iii) Its general merits as a place to live in: relative smallness, high standards of amenity and educational opportunities. In times when a greatly increased number of people have more or less secure salaried jobs, and when salaries for the same kind of post are much the same in all parts of the country, intelligent people will naturally pay attention to the place where the job is. Under these circumstances Cambridge will grow. The town is also likely to prove attractive to civil servants, officials of public corporations and professional people when they retire. In addition, a small number of people now travel daily from Cambridge to work in London. The introduction of a 60-minute service or completion of the electrification scheme might add considerably to this number.

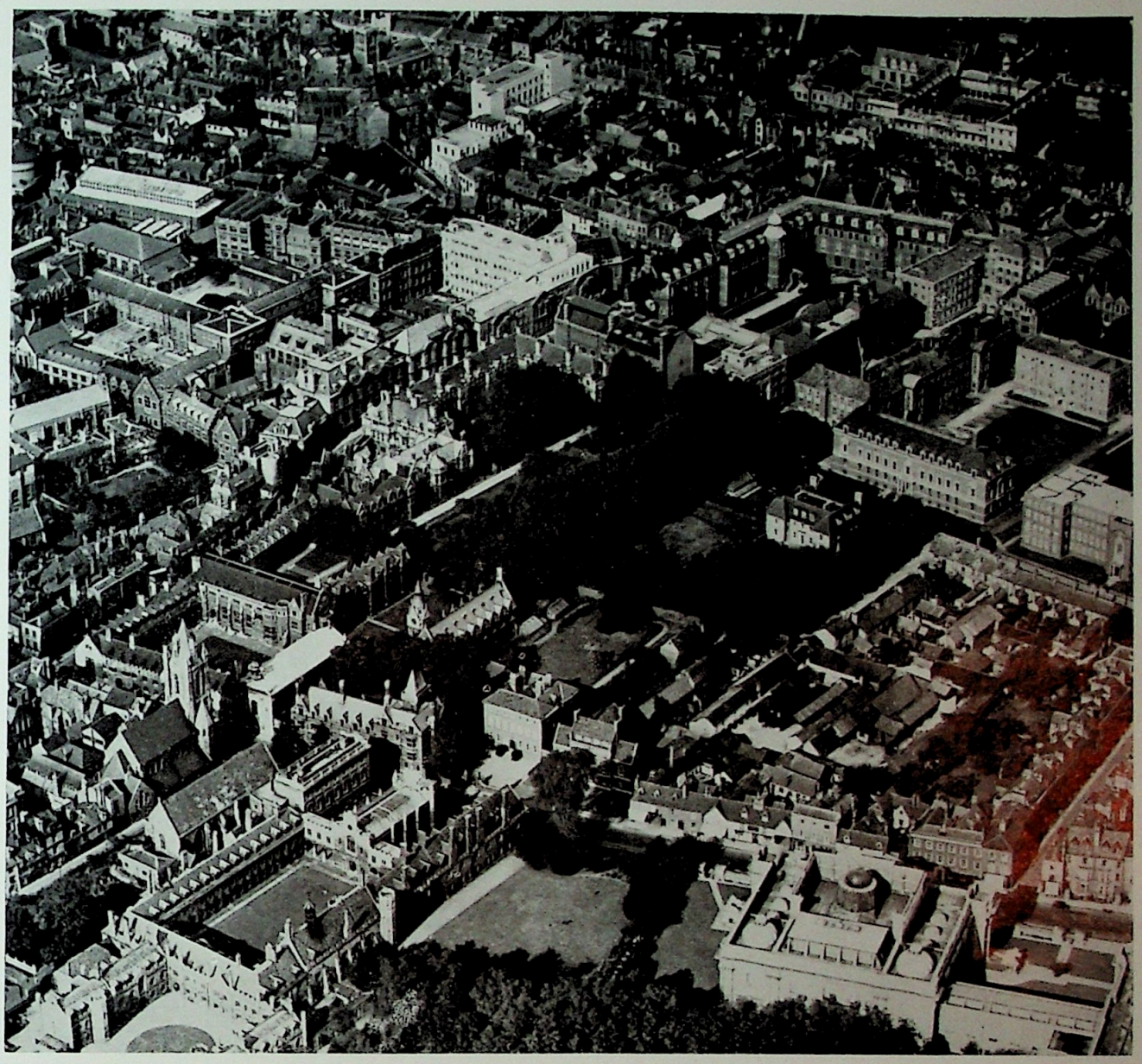
(iv) Expansion of the University. The extent to which University population will grow is still undecided. We think some increase is probable even if the number of undergraduates remains much the same. Post-graduate studies are a growing part of University work and buildings and equipment grow more elaborate and need more people to maintain them.

(v) The pull of the government Regional Centre. Firms which have much to do with the regional offices of government departments will tend to establish an office—perhaps even their head office—in Cambridge. This process has already begun.

(vi) Its suitability as a centre for Government and other non-University research institutions—particularly in the two specialities of science and agriculture.

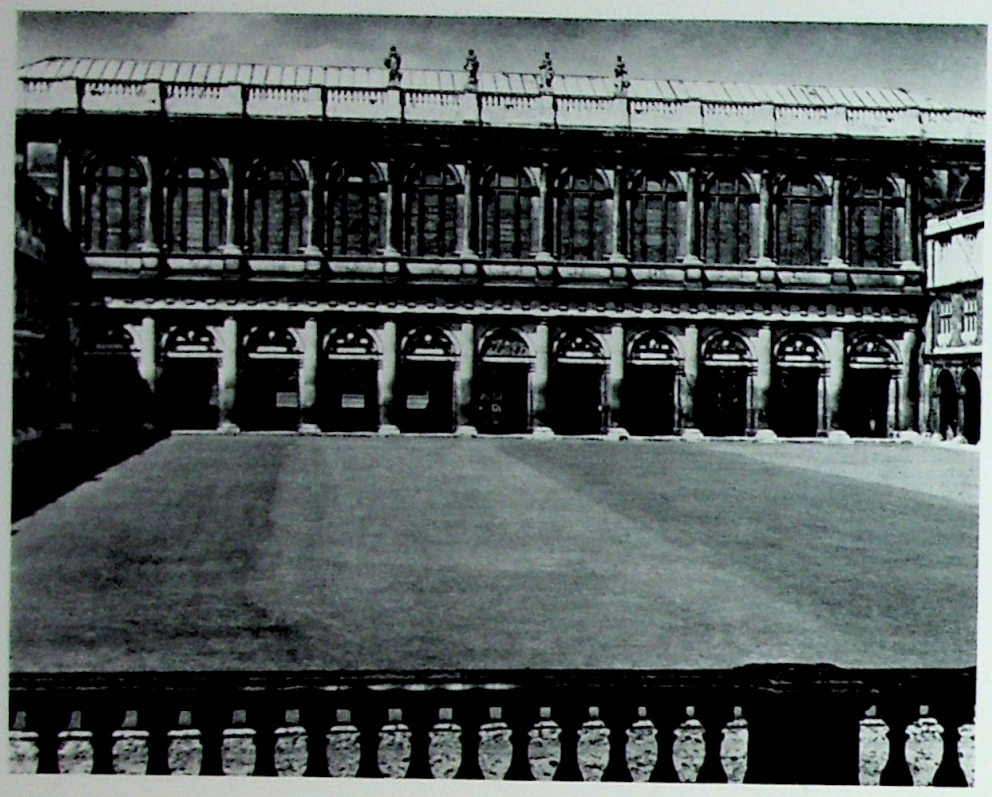
274 One can only guess at the rate at which population might grow if all these attractions proved real and operated unchecked. If immigration continues at its present rate the population of Urban Cambridge will grow by rather more than 20,000 in 20 years. But this takes no account of a large expansion of a single employment or group of employments. A lopsided expansion of this kind might repeat at Cambridge the story of Oxford, where insured workers in the motor-car industry rose to 10,000 in 16 years, and where, in 1936, 43 per cent. of the adult male insured workers were immigrants.

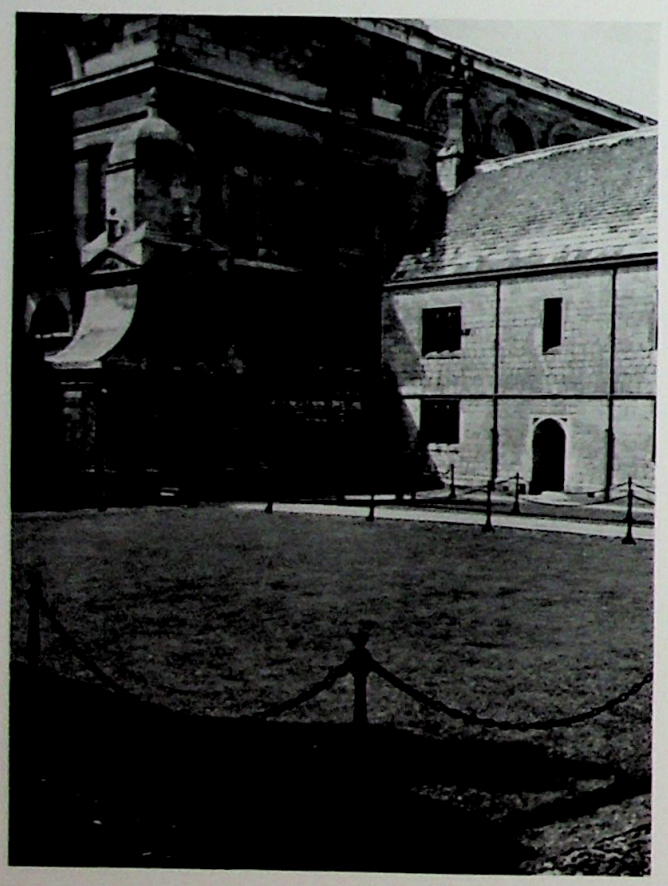
275 The best way to reach a decision on the optimum population for Cambridge is perhaps to list those of its qualities which most people would wish to retain or



BUILDINGS NEAR THE CENTRE.

Top : looking north-east from above the Fitzwilliam Museum. The University science buildings are seen beyond the gardens of Pembroke ; beyond them are the commercial buildings along St. Andrew's Street. *Right :* looking south from St. John's chapel towards Market Hill, with Trinity Street in the centre of the picture.





THE FORM OF COLLEGE BUILDINGS.

Top : *left :* Nevile's Court and the Library at Trinity ;
right : Cloister Court at Queens'.

Below : *left :* Caius Court and the Gate of Honour, Gonville and Caius ;
right : Brick Building, Emmanuel, from the west.

improve; and then to decide whether an increase of population is likely to harm or add to them. The list would probably run something as follows:—

Full employment, coupled with diversity of opportunity for young people.

Good houses.

The University. The University and College buildings and their setting.

The central open spaces, the countryside near the town and plenty of gardens and allotments.

Short distances between homes and work, and between homes and the central shops.

Good services: education, medical, shopping and entertainment.

Maintenance of Cambridge as a good centre for country residents and visitors, and of its distinctive market-town character.

276 In addition, far-sighted people might well favour such expansion of the University as it may require: some additional facilities for visitors, conferences and general out-of-Term commerce; and possibly some expansion, in or near Cambridge, of research and prototype work closely connected with the scientific work of the University. Beyond moderate expansion in these three fields—accounting perhaps for a 5,000 or 10,000 increase in population—we believe no large body of opinion desires a growth of population as such. Citizens of an ancient Borough may naturally hope that one day Cambridge will become a County Borough, for which a population of 100,000 used to be regarded as a prerequisite. But for the next few years at least there is bound to be a standstill in the status of Local Authorities; and it would be a pity if the problem were to be approached on the basis that mere size is to be preferred to the general good of the town or to good relations between local authorities. The impulse towards growth is just the sum of individual shortages of labour—of each employer hoping to fill his own vacancies or open a new branch of his establishment—and there is no sign at present of this impulse being balanced by firms going out of business or reducing establishments.

No Advantage in Further Growth

277 We have tried to find out whether any real advantage would be gained—boom or slump—from a general growth of population, and cannot discover any which is likely to be lasting. Certain selective increases could of course be beneficial. More building labour might end the housing shortage sooner; and there might be a national, not necessarily a local, advantage in filling all vacancies in the go-ahead scientific industries. But as long as there is a shortage of labour in south-east England we think a general filling of vacancies in Cambridge would inevitably draw in more employers, and that soon the *status quo* would be restored, with living conditions for almost everyone a little worse than they were before.

278 When a longer view is taken it still seems to us that a large growth of population would have many drawbacks and would bring no advantage to the general body of citizens.

279 First and foremost a large growth would hinder the work of the University. As the pursuit of knowledge becomes more and more specialised and demands more complex buildings and equipment, it follows inevitably that social life within the University, quiet surroundings and nearness of buildings to one another, become more valuable. In a bigger Cambridge these things would be harder to preserve or obtain. Every good building site would be the subject of keener competition, and if the University and Colleges acted vigorously in defence of the University interest—as would be their duty—ashes of old disputes would warm up again. This is no fanciful possibility. For example, housing sites reasonably near the centre of the town would become harder to find and it might well seem reasonable to suggest that College playing-fields should be used for this purpose, in exchange for new playing-fields farther out. But some College playing-fields are already far out, and an increase in the average distance would discourage a valuable side of University life. The idle undergraduate is a figure of the past, and others besides the University Grants Committee have remarked on the close—sometimes overclose—application to study by the average post-war student. It is obvious that this is only one of many ways in which the needs of the University would clash with those of others in a rapidly growing town.

280 The pros and cons of a large growth in population could be examined from a number of other points of view. We think that one—that of the ordinary citizen—is sufficient for our argument. We are sure that the present size of Cambridge has many advantages for the ordinary citizen. It is small enough to retain most of the advantages of a small town and big enough to provide a full range of amenities and services. One can cycle home to a mid-day meal, the countryside is still very near, and nearly all dwellings have gardens. Cambridge suburbs are no better than those of other towns but none is very big; the river, the Commons or the countryside can be reached in a few minutes from any of them. These may be part of the natural order of things in Cambridge, but to most town dwellers of Britain they would be luxuries. A big growth of population would diminish or abolish them. The inner districts would have to be redeveloped with bigger, more crowded, buildings or the countryside would have to be pushed back by several square miles of new suburbs—the latter being the more probable. Allotments would be at a premium, the central open spaces crowded, and three to four miles between home and work would jeopardise a return home for a mid-day meal. In other towns loss of small-town assets has been offset to some extent by acquiring those of a big town—educational and medical services and facilities for recreation. But Cambridge has these big-town assets already—a public indoor swimming pool being almost the only missing amenity. A slightly bigger range of jobs

would seem to be the only gain from a bigger population which the ordinary citizen would have to set against many losses.

Limitation of size

281 For these reasons, and the others relating to the central area given in the first Chapter,* we recommend that the Committee should try to reduce the rate at which Cambridge is growing and to reach a stable population at some level not much in excess of present figures. We suggest 100,000 as the ultimate ceiling for the Borough—to be reached as slowly as possible—and 120,000 or 125,000 for the larger area of Urban Cambridge. We believe that if this could be done the present character and fine qualities of Cambridge could be retained and that most of its defects could be remedied within 20 or 30 years.

282 We make this recommendation with full appreciation of the difficulty of carrying it out. No ancient town comparable with Cambridge has ever tried to limit its population. Until recently nearly every town has tried to attract population. The investigations of the Barlow Commission have, however, changed opinion very considerably. It is now generally appreciated that a town of 200,000 is not necessarily better than one of 100,000, in efficiency of services or local administration or in any other way. The increase of population in the south-east at the expense of the rest of the country is regarded as nationally undesirable, and Cambridge has had its full share of abnormal increase since 1937. In addition, the Government desires to expand University education, especially on the scientific side; and we have tried to show that the work of the University would be hampered, and probably gravely obstructed, if Cambridge grows rapidly. There are therefore two good reasons why the Committee should be able to rely on the help of central government in reducing immigration into Urban Cambridge. We believe that if the County, the Borough and the University were agreed on this matter, the great influence which Cambridge has at its command could be successfully exerted.

283 The methods by which a policy of stabilising population could be carried out cannot be considered in great detail in this report. The first step, we suggest, is to obtain fuller information on the rate and causes of immigration. The second would be to reach agreement between the local authorities and the University on the desirable level of future population. The third would be to seek the support of central government, notably the Ministry of Town and Country Planning and the Board of Trade; for without the support of the government and a clear knowledge in Departments of the issue at stake, no policy could be made effective. It is clear that it will be the means and not the ends which will be hard to agree, and harder still to put into execution.

284 The new employment which seems to us least justifiable in Cambridge is that of mass-production, especially mass-production from materials that have to be brought into the district. We recommend that the Committee should seek the support of the Board of Trade in discouraging new enterprises of this kind within Urban Cambridge and any considerable extension of those now existing. Some of the industries in Cambridge, including those in which a large expansion is more probable, have connections with the scientific work of the University, and frequent consultation with University scientists may be necessary to their business. Where a firm of this kind desires to expand we suggest that it might be possible to make a division between the research and prototype side of its work and actual production in quantity. In some cases it may prove practicable to remove the mass-production side to parts of the country where new employment is badly needed. In other cases we suggest that the firms should be encouraged to consider setting up a factory in one of the six towns that are spaced around Cambridge at distances of 14 to 18 miles. We recommend that the Committee should ask the Ministry of Town and Country Planning and the Board of Trade to examine this proposal and to consult the local authorities concerned.

285 We also recommend that the Committee should ask Departments of central government to reduce to a minimum their own demands on the Cambridge labour market and to use their influence to reduce those of government or government-aided research institutions and public corporations. There is no doubt that if new jobs continue to be offered by these employers at the rate of the past few years central government will itself be responsible for a considerable portion of Cambridge's growth.

286 Central and local government authorities at present possess powers which would enable them, if they see fit and if they act in collaboration, to control the growth of Cambridge very strictly. The Committee themselves have power, given the support of central government, to control the growth of Cambridge absolutely in terms of buildings and very considerably as regards population. But every control has disadvantages and may have ill consequences which require study and expert knowledge to foresee. We therefore recommend that the Committee should approach the University—as being the body most likely to suffer severely from a rapid growth in the town's population—and ask for their assistance in reviewing the powers now available to central and local government which might be used to slow down the rate of growth of the population of Urban Cambridge. The Committee might also wish to invite the Regional Controller of the Ministry of Town and Country Planning, as representing the central authority, to assist in this review, the object of which would be to determine the probable effects on all those concerned of a fuller use of existing powers.

287 These powers will be found to be partly restrictive and partly constructive, and there will, we think, be general agreement that the former should be used no more than is necessary. In this report we consider only the problem of Urban Cambridge, the area within four or five miles of the centre; but the problem is clearly one affecting a much greater area. Powerful forces seem to

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* Paras. 89–93.

us to be making for an increase of population in this bigger, *Greater Cambridge* area. The best solution, from the point of view of Urban Cambridge, would be for those forces to be deflected to other parts of the country by positive means such as the provision of finance and grant of building licences. If an increase somewhere in the *Greater Cambridge* area is regarded as desirable, or inevitable, it should preferably be guided by the same means to definite places—either to some of the six towns around Cambridge or to selected satellites nearer in. It is hardly too much to say that the location of all new enterprises and bigger extensions could be determined at present exactly as central government and planning authorities desire, provided that they make land available and grant building licences in the desired places. They have power to do this—local authorities can go further and erect the actual buildings. We think the Committee will agree that this kind of planning control should play as large a part as possible in limiting the population of the Urban Cambridge area.

PLACES OF WORK IN THE BOROUGH

288 The present distribution of places of work in the Borough is shown on Map 30. The most striking thing about this map is the different conditions on either side of the Huntingdon Road–Hills Road line. Except in the central area there are very few shops or factories to the west of this line, the land being used almost entirely for University purposes or for residence. East of the line, however, all land within a mile and a half of the centre is peppered with shops, warehouses and factories.

289 At first glance the workplaces of east Cambridge seem to be distributed haphazardly, but this is not entirely the case. They can be divided, very broadly, into the three classes of larger factories, shops, and smaller factories and workshops, to each of which different siting conditions apply.

1. *Larger Factories*

290 Most of the larger factories and industrial premises lie in a roughly T-shaped area whose axes are the railway line and Newmarket Road. This is on the whole a convenient grouping. The area around Barnwell (Newmarket Road) railway bridge is the most suitable situation in Cambridge for larger factories. Smoke and fumes can blow clear of the town, and the two new river bridges proposed would enable traffic to and from the factories to avoid the centre of the town almost entirely. We propose that larger factories, at present elsewhere in the town, should be encouraged to move to east Cambridge when they come to consider rebuilding and that sites should be reserved for this purpose. We suggest four sites for reservation, shown *cross-hatched purple* on Map 33. Two of these—the northern and eastern—would be suitable for breweries or other industries liable to produce smoke or smells. The southern one, it is suggested, should be reserved solely for the proposed new buildings of the University Press.

2. *Local Shopping Centres*

291 The problems of the central shopping area of Cambridge, in which we include Fitzroy St., were considered in the first chapter and will be further examined in the fourth. Many of the remaining shops are within the local shopping centres which are *ringed in blue* on Map 30. It will be noticed that these shopping centres are all situated at busy traffic junctions or front on streets which carry heavy traffic. Local shopping centres are a great convenience to most families, and nowadays when petrol, domestic help and telephones are scarce, they are of increased importance. We believe that local shopping centres in Cambridge are likely to grow and that it is desirable that they should. The best situation for such centres is, however, just off, rather than fronting directly onto, a busy junction or street. In our proposals for Mitcham's Corner and Mill Road* and in the studies that have been made for new housing estates, we suggest ways in which local shopping centres could be insulated from heavy traffic while remaining well in the public eye. Improvement of the layout of an existing centre is a long and expensive process, and it is therefore the more necessary that the shopping centres in new residential estates should be properly sited and laid out from the start.

3. *Workshops, yards, etc.*

292 The remaining non-residential buildings and uses in east Cambridge comprise all those usually found in towns. They range from dance halls and furniture depositories down to scrap merchants' yards and tips. By far the most numerous class are small workshops and yards. These are scattered throughout the districts nearer the centre in a haphazard manner, the factors which determined the siting of most of them being more or less suitable premises, low rent, and lack of ability on the part of neighbouring residents to protest effectively against their arrival.

293 A large proportion of development applications come from these small enterprises, and the Committee are aware how difficult it is, in many cases, to reach a decision which is fair as between the applicant and the interests of the neighbourhood or the town. Most of the applicants have limited resources and many of the proposals which they put forward would not help to improve the locality. Workshops and yards scattered through a residential district lower its value and the distribution is often inconvenient for the workshops themselves. Every additional workshop or extension may, and usually will, make the process of disentanglement more difficult. It would, of course, be simple, in one sense, to refuse all such applications and thus gradually clear " mixed use " districts of all workshops; but we do not think the Committee will

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* Paras. 75, 84–85 and Map 10.

find it reasonable to take this course. These small enterprises, taken together, are a large and essential part of the town's industry. At any time the small man has a special claim to help from the local authority as he cannot usually afford a good professional adviser or more than a small outlay. This is particularly so as regards building development at present. When an application from a small enterprise is refused in regard to one site the applicant often asks the Department to recommend an alternative site; and the root of the trouble is that at present the Department can rarely or never recommend another area in which the applicant has a reasonable hope of obtaining one. Until this situation is changed we think the Committee will feel themselves compelled to grant a number of applications which are undesirable and which will heap up trouble for their successors. In our view the changes needed could be made without great difficulty and we propose two measures to this end.

294 Our first recommendation is that a number of sites in different parts of the town, both developed and undeveloped, should be reserved for small factories, warehouses, workshops and storage yards. These sites, which we call *Service Industry Sites*, are shown *solid purple* on Map 33. In all they contain a considerable area—200 acres. Some are partly developed and already extensively occupied by industry, some are partially derelict and some are undeveloped sites of good quality. We propose that a layout plan, embodying a modest programme of improvements in areas already developed, should be prepared for each of these sites; and that thereafter erection or extension of premises for service industries should be freely allowed within them—subject to conformity with the layout plan and to their being inoffensive in the technical sense. In order to encourage owners to make land within these sites available for industry, we propose that future applications to use it for residence should be refused.

295 Our second recommendation is that the Borough should acquire* or make available forthwith two or three undeveloped sites from among those described in the previous paragraphs. These sites, which need not be large, are shown *hatched purple* on Map 33. We propose that after acquisition the Borough should lay out and prepare the sites for the erection of small industrial buildings, and should themselves erect on a portion of each site buildings of the type known as nursery factories—small workshops, equipped with water, light and power, etc., and available on lease or short tenancies. Workshops of this kind have proved a great boon to small enterprises wherever they have been built† and have also paid their way. If the Committee, in collaboration with the Borough, were able to offer an alternative site, or a building, to an enterprise that proposes to build or extend in an unsuitable district, there would be little difficulty in removing unsuitable uses from residential areas within a reasonable period of years, and the redevelopment of obsolete blocks of buildings by convenient stages would be greatly assisted. Our intention is that the sites acquired by the Borough in this way should be reserved for small enterprises already in existence in the Borough and for persons who, so to speak, have served their apprenticeship in the Borough and wish to set up in business on their own account.

296 In granting permission for industrial development we recommend that the Committee should try to suit the development to the site. Some of the sites we propose for industrial use have been damaged by past use or are littered and untidy. Others are on good new land. Industrial developers are no more anxious than other developers to accept the burden of remedying the misdeeds of the past, and in some enterprises the appearance and surroundings of the factory will make a great difference to the type of employees whom they retain or recruit. On the other hand it is reasonable to hold that certain industries can make do with less attractive sites—for example, scrap merchants, manufacturers of bituminous materials and cast-concrete products, most storage yards and most maintenance yards.

Enterprises suitable for shopping centres and service industry sites

297 A hard and fast line cannot be drawn between businesses which should be in local shopping centres and those which should be on sites reserved for service industries. Decorators, plumbers, ironmongers, small dairies, bakeries and laundries and similar businesses may suitably be located in either type of area. It is desirable that all premises on a shopping frontage should have display windows, as an interruption of these displays is bad for trade. Those whose businesses will not run to the rents and rates of shopping frontages will not, of course, develop in local shopping centres unless a suitable site is available behind or to one side of the shops. Their choice will usually be to take a plot or rent a building within a service industry site.

Livelihoods carried on from dwellings

298 By the measures described in the previous paragraphs we believe it would be possible to remove from the central residential districts, within 15 or 20 years, nearly all uses that would appreciably detract from their pleasantness as places to live in. But this does not necessarily mean that there would ever come a time when all buildings in these districts were used solely for residence. Even in residential districts protected by strict covenants some portions of some dwellings are used for livelihood—for example, by dons, clergymen and doctors. From this level dual use of dwellings descends by many gradations, first to the point where dual use adversely affects residential values, and then to the point where whole buildings begin to be used for non-residential purposes. Dressmaking, weaving, typewriting, music-teaching,

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* Under the powers contained in Section 38 (2) of the Town and Country Planning Act, 1947.

† e.g. on the various Government Trading Estates, at Welwyn Garden City and elsewhere.

insurance agency, keeping a guest house, and a score of other livelihoods, are commonly carried on in houses, part-time or whole-time, and all are liable to annoy neighbours and reduce the value of property. Now that the Committee possess full powers to control the use of land and buildings there may be a tendency to expect them to arbitrate on these questions and to lay down the exact line where a deficiency in good neighbourliness shades into a minor nuisance. We feel the Committee may be rightly reluctant to become a judge of such matters, which we think are best decided between landlord and tenant, or in the case of nuisance by the Courts. As we see it, the Committee's concern will rarely extend to smaller matters than a substantial change in the use or the appearance of a whole building. And this view appears to be confirmed by Ministerial policy portrayed in recent Statutory Instruments and decisions given on Appeal.

OUTLINE DEVELOPMENT PLAN FOR THE BOROUGH

Provisional Boundary

299 On the assumption that the Committee would accept our suggestion of a population limit for the Borough of about 100,000 people, to be reached as slowly as proves practicable, we have considered how much new land would be needed in the next 20 or 30 years for new houses and other buildings. We have also considered the boundary beyond which building development should not be permitted save in a few and very exceptional cases. We have chosen a provisional line for this boundary which is shown by a broad *green* line on Map 31 and a *green dotted* line on Map 33. In choosing this line we have sought to prevent Girton, Cherry Hinton and Grantchester becoming merged in the built-up area of the town by the maintenance of intervening strips of unbuilt-on land. These must, unfortunately, be narrow, and it is the more necessary that they should be permanently safeguarded. The provisional boundary also maintains the green wedges along the river, keeps the open countryside near the centre of the town on its west side, and excludes development from the foothills of the Gogs.

300 The only two developments beyond the boundary which we recommend the Committee to accept are University buildings on the former " Sebro " site and on land between that site and the proposed New West Road; and, secondly, the use for houses of the site known as Arbury Road North if this proves necessary to fulfil the Borough's housing obligations (see Map 33). The extension of building along the Madingley Road is generally regretted, but given the existing buildings on the "Sebro" site (some with heavy reinforced-concrete foundations) and the present shortage of building accommodation and resources, we think the arrangement come to, by which the University has taken over the site and will gradually redevelop it for University purposes, is the best that could reasonably be hoped for. The land on the north side of Arbury Road will not be needed for houses in the near future, but it seems to us reasonable that in due course the proposed northern bypass, shown by a *green dotted* line on Map 33, should become the boundary for development in this area.

Land available

301 Within the provisional boundary there are about 1,500 acres of land available for development—that is, land not at present developed with buildings and likely to be so developed if normal inducements operate. Land available is shown *yellow* on Map 31. 1,500 acres—more than two square miles—is a considerable area, but it is not in fact too much for Cambridge's needs. The *yellow hatched* areas on Map 31 are already bespoken for some building use, in the sense that planning approval has been given or a definite scheme is known to the Planning Department. These hatched areas amount in all to about 700 acres or half the land available. When one bears in mind the many other buildings likely to be needed in the next 20 years, for University and College purposes, for schools (which now require much larger sites than before the war), for factories moved to the outskirts of the town and for other purposes, the amount of land available seems likely to provide developers with no more than a reasonable choice of alternative sites.

302 In our view the Committee should try to provide developers with a sufficient but not an excessive choice of sites. A number of small isolated sites will be seen on Map 31 within the general mass of the present built-up area. The larger part of these are good building sites which for one reason or another were not built on as the town developed and which it was not worth while to develop in the inter-war years when land on the outskirts was easy to come by. The fixing of a provisional boundary will direct attention to these unused sites and will encourage their being brought into full use either for buildings or as small open spaces.

The Development Plan: Summary of Provisions

303 Map 33 shows our general proposals for future land use in the Borough. During the last few months a number of new development projects have been put forward and others have been amended. The development plan will therefore require review district by district before submission for the Minister's approval and some changes may be necessary. The following are the main provisions of the preliminary plan.

Provisional Boundary

304 This has been kept fairly close to the edge of the existing built-up area. Broad wedges of unbuilt-on land are proposed on either side of the upper and lower river, forming a continuation of the Backs and the Commons. On the west and north the boundary generally follows the lines of the proposed bypass roads. It is proposed that green belts should be retained between Girton and

Cherry Hinton and the general built-up area of the town. Development proposals for villages near the boundary, such as Fen Ditton, Grantchester and Fulbourn, will require study to make sure that the boundaries fixed for building development in these villages preserve adequate green belts between them and the town.

Housing Sites

305 The proposed sites for the houses on new land listed in Table 10 are shown on the plan. Sites proposed for Borough dwellings are shown *hatched buff* and those for private enterprise are outlined with a broad *buff* line. About 4,500 new dwellings are provided for on these sites. With one exception the proposed sites for Borough estates are in the north, east and south-east, and the majority of the private enterprise houses are sited in the Queen Edith's Way–Wort's Causeway district where a comparatively large number of houses could be built within a few years. We propose that the land between the Backs and New West Road should generally be regarded as a reserve for University buildings, but it seems to us unlikely that more than a portion of the undeveloped land east of New West Road will be needed by the University for a long time to come. We therefore propose that this land should be used for houses; and that some of them should be of a size and type similar to those built by the Borough, and be made available to those on the Borough Housing List. We think it essential that all land in this part of Cambridge should eventually become available for University purposes. If the small houses are to be built by the Borough it will be necessary to make special arrangements for the reversion of the land to the University in due course. Alternatively the houses could be built by an *ad hoc* housing association. We propose that most of the land around the centre on its east side should be redeveloped to provide dwellings. The most important exception is our proposal that the land near Emmanuel Road should in time be redeveloped with modern shops and offices as a central area extension.

Future Gross Neighbourhood Densities

306 The effect of our various proposals on the future distribution of population and land available is summarised in Table 14 and Map 32. It will be seen that densities in some areas are diminished but in most cases are slightly higher, although judged by the standards of large towns they are still very low. Family population is distributed in accordance with the siting of new housing and the redevelopment of derelict areas. The redistribution of the student population is based on the requirements stated by Colleges in discussion of their future needs. In examining Map 32 it should be borne in mind that, in calculating gross densities, land in agricultural use and railway land were not taken into account. In some sectors we propose the future use for housing of land that is now used for agriculture; and in these sectors the increase in gross density may therefore not be proportional to the increase of population.

Schools

307 The Ministry of Education's land requirements for new schools are much larger than before the war. For example, a new secondary school with playing-fields will require about 20 acres of suitable land if it is to conform with the recommended standards. A provisional distribution of school sites is shown on Map 33 (*green* outline and *red* dot) and it will be seen that, taken together, they occupy an appreciable proportion of the land available.

University and Colleges

308 We think that new University sites will have to be found west of the Backs to an increasing extent as time goes on. University land requirements are considered in more detail in the next chapter.

Local Shopping Centres

309 We believe local shopping centres will handle an increasing portion of the town's daily shopping. Proposed sites for these centres are shown in *blue* on the plan, but will require some further study—especially those which now occupy a considerable length of a main traffic route.

Industrial Sites

310 These are shown in *purple* on Map 33 and we consider them fully adequate for the town's needs. A majority of the sites are near the Station or Newmarket Road—the two most suitable districts—but some provision for service industries has been made in each part of the town where a need is likely to arise.

CHAPTER THREE

THE UNIVERSITY AND THE COLLEGES

CAMBRIDGE is distinguished among all English boroughs in being not only a University town, but a town in which a University and its Colleges still mould the pattern of its streets and passages and river banks and buildings. Although the town itself, as the agency for housing and highways and social services and utilities in general, has by far the greater immediate responsibility in matters of the appearance and development of Cambridge, there are several ways in which the University and Colleges exercise an indirect but possibly profounder influence. In the first place there is the University's national function, which must in some things take precedence over any matter of merely local significance. In the second place the land in joint use by University and Colleges is very extensive and almost surrounds the heart of the town, as is shown on Map 34. Under Section 85 of the 1947 Act nearly all this land is likely to be scheduled, and thus reserved for all manner of academic purposes. Moreover, Map 34 and other drawings in this report relate to the *use* of land, but when the maps showing *ownership* are assembled one can see at a glance that University and College lands comprise a large proportion of the Borough and thus represent, in one very real sense, the dominant interest.

312 There is also a third, historical, influence exercised by the University and Colleges on the actual and changing town plan of Cambridge. That is the collegiate plan itself, which has given both form and character to an unbroken tradition of domestic and community building from twelfth- and thirteenth-century religious houses down to the design of the residential neighbourhoods under construction today. The Colleges, the Inns of Court, the town squares and the closes of Welwyn Garden City, are all in that tradition. It is not only one of the most valuable elements in town design, combining as it does convenience and economy and reasonable compactness, with opportunities for seemly civic architecture, gardening and planting, but it is found in its completest and most influential form in Cambridge itself. It is true to say that in the Minister's listing of buildings of historic and architectural interest (under S. 30 of the Act) a large part of the town should come up for consideration, if not for the importance of the buildings themselves then as an unparalleled example of the collegiate tradition of layout and grouping, or as streets which preserve the form of an ancient county town.

313 A first aim of a development plan for Cambridge must be to provide as well as possible for University and College needs, and some assumptions concerning the future of the town are necessary to any useful examination of the location of future University development. We have assumed that the recommendations in our first and second chapters will be accepted. In particular, we have assumed that the population of the Borough will not increase much beyond 100,000 and that the proposals for a spine relief road and a western boundary road and by-pass will eventually be carried out—thus forming in time a central precinct in which the existing character of streets and buildings could be largely preserved.

EXISTING DISTRIBUTION OF BUILDINGS

314 Map 34 shows the existing distribution of University and College buildings and playing-fields. We have divided the buildings into four broad classes which we think significant in considering future development. The map shows: —

1. Departments, mainly scientific, which may expand rapidly in terms of buildings.
2. Departments which seem less likely to expand rapidly, including Arts, Administration and the University Press.
3. Other Departments and Institutions, e.g. the Observatory and University Farm.
4. Colleges and subsidiary colleges.

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5. College Playing-fields.
6. University Playing-fields.

The junction of Bene't St. and King's Parade has been taken as the present centre of University life, and circles at $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1 mile radii have been struck from this point.

315 The most notable features of this map are the close grouping of most of the buildings around the town centre and the fact that nearly all are placed on or to the west of the spine road. It can be seen from Illustration 35 that the Colleges were built in a ring around the centre of what was formerly a small market town, on the gravel terrace approaching the river crossing. The Colleges in turn were ringed by the low-lying and common lands that have become the Backs and the Commons. As the town grew in size a third ring of buildings came into existence, first on the east in what are now the industrial districts, and later on the west.

316 The expansion of the University during the half century up to 1920 consolidated rather than loosened the ring of University buildings around the centre. Pembroke, Caius, Trinity and other Colleges extended their buildings in the centre and the gap in the ring along Downing St. was largely filled with scientific buildings. Up to then the two women's Colleges and Selwyn were almost the only University buildings lying outside the ring around the centre. Between 1920 and 1940 growing

scarcity of land and the growth of traffic and commerce were reflected in differences in policy on the location and form of new buildings. The traditional policy of keeping near the centre was followed by the University in new buildings on the Downing site and in Mill Lane, and by St. John's and Magdalene Colleges. Caius and Sidney Sussex also built buildings in the centre but took the new and significant step of designing the ground floors of the buildings for use as shops, and thus reprovided in an improved form the shops which they demolished. A step of great significance was taken by Clare College when it built its memorial buildings on the west side of the Backs. To some extent the new Clare buildings have relinquished the advantages of proximity to other Colleges and the centre for those of quiet and a spacious site. The isolation is, however, more apparent than real since the Memorial Buildings are as near in walking distance to Bene't St. corner (which we have taken as the centre of University life) as is either Magdalene or Jesus. The University's first considerable departure from the policy of keeping within the ring was the building of the engineering laboratories on Coe Fen. Its second was the building of the University Library on the west side of the Backs.

317 Other developments up to the beginning of the recent war were not of great moment. Buildings and land acquired for agricultural studies were necessarily at some distance from the centre, and College playing-fields also tended to move farther out. But Map 34 shows that virtually the whole of the University town, as well as the commercial centre, is still contained in an area a mile long by about half a mile wide, of which an appreciable part is occupied by gardens and other open spaces. This smallness of the central and famous part of Cambridge combined with the spacious setting of many of the buildings is most striking.

318 In general, the present distribution of University and College buildings forms a compact and simple pattern. The main College buildings almost completely ring the centre of the town and the farthest apart* are less than three-quarters of a mile from each other. The administrative and Arts buildings are centrally placed in a U extending from the Old Schools to Mill Lane; and the Library, which is of special concern to the Arts faculties, is on the east–west axis of the central area. The great mass of the Science buildings are compactly grouped astride the southern edge of the ring. In broad terms, teaching and administrative buildings are confined to the south-west and southern parts of the University town, the northern and eastern parts being occupied only by Colleges. Jesus College is the only important academic building to the east of the centre. This distribution shows that up to now the major principle in siting all University buildings has been to keep near the centre. and that only in a very few cases (notably the Library) has this been departed from.

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* Excluding the two women's Colleges.

LOCATION OF FUTURE BUILDINGS

319 The cessation of building from 1939 to 1945, the Government's desire for an expansion of University education and the considerable number of new buildings which are now in prospect all make it desirable to see whether it is possible to arrive at certain policies or principles which should guide the location of future University and College development. It appears to us that a general review of this kind is necessary to ensure that University and College needs are properly provided for in the development plan for Cambridge.

320 Our own examination of the question suggests that certain things are likely to be agreed by all those interested in the future of Cambridge. Among these is the retention of the existing character of the town and especially of the centre, where the small scale of residential and commercial buildings gives the older University buildings and Colleges a suitable pre-eminence. Secondly, there is likely to be a general desire to avoid sprawl and to group similar uses together in a reasonably compact manner; and with this may be bracketed the desire to keep the countryside near the town centre at a number of points. Thirdly, there is the retention of the line of the spine road (Huntingdon Road to Hills Road) as the approximate boundary of University uses. Agreement could probably be reached on a number of other matters more directly associated with University development. For example, University buildings tend to become larger, more specialised in design and more complicated in equipment, and in the next 20 to 30 years an appreciable growth of the University, in terms of buildings if not of undergraduates, seems certain. It also seems probable that the number of sets of University lodgings will not rise again to pre-war figures and that Colleges will find it necessary to make other provision for undergraduates.

321 The optimum conditions for University life are not likely to be generally agreed. What can reasonably be hoped for is agreement on factors that are influential. Among these are the size of the University, the number and size of Colleges, distances between buildings, and the kind and amount of non-University uses among University buildings that are best calculated to serve the interests of the University. The information we have so far been able to collect throws little new light on these complex matters. We note a strengthening of belief, both in this country and the U.S.A., that a University should not grow too large, and that there are limits to " the mitigation of size " provided by the collegiate system. We have also noted that in our discussions with individual Colleges the figure of 300 was mentioned on several occasions as an optimum number for the undergraduate body of a College.

322 We have examined the distribution of University buildings in a number of Continental and American University towns. The distribution in six towns is shown in Illustration 36, but the great differences of University size and organisation and differences between the towns prevent any real comparison with Cambridge save in

terms of distances. On the Continent older buildings tend to be near the centre and the newer (chiefly scientific and medical) are in one or more groups farther out. This is as one would expect. In general, American Universities follow the " Campus " system in which all University buildings are contained within a single large, park-like site. Because of its collegiate structure Cambridge University occupies far more of the land near the centre than does the University of any Continental town, but the distances between the centre and the Engineering School and the Library are similar to those between central and peripheral buildings on the Continent. On the other hand if there is a considerable expansion west of the river the grouping of buildings there would come to bear some resemblance to the American pattern.

323 Three general policies seem open to the University in siting future buildings: to try to remain in the centre; to move out westwards; or to site new buildings, according to their kind, within a few areas chosen and reserved for the purpose. We think it is useful to try to set down the arguments for and against each of these policies.

The Case for Remaining in the Centre

324 The argument for keeping nearly all new buildings very near the centre may be put in this way:

The Colleges are fixed and almost all the Colleges which are contemplating extensions desire to place them on immediately adjoining land—as is shown on Map 37. The governing bodies have presumably weighed the disadvantages of central sites—as regards noise, ventilation, lighting and limited area —against the advantages of proximity to other Colleges. That they still favour extension in the centre is a strong argument for its advantages, which may be greater in future than ever before. Undergraduates work harder than before the war and studies tend to multiply and become more narrowly specialised. Acquaintance between undergraduates in different Colleges and reading different subjects should be encouraged by short distances between rooms and teaching accommodation.

325 If Cambridge were going to become a large town with its central commercial area between the spine and King's Parade–Trinity St., a concentration of University buildings in the traditional area might not be practicable. But the Consultant's recommendations include a resolute effort to limit the population of the Borough. Even if population is not kept down to the desired level the centre of Cambridge cannot make a good commercial centre for a large town; the sites are too small and awkwardly shaped and the streets too narrow. Thirty or so new shops can be provided in the proposed new Guildhall St. and if more come to be needed they should be provided east of the old town centre.

326 There is no question of the University pushing out shops and offices in an arbitrary manner. In almost every town there has been a tendency in the last 30 years for the mass of the central shopping trade to be done within a progressively smaller area, and larger well-sited shops have a great advantage. Cambridge is no exception to this rule. Trade has been moving southwards and eastwards in the central area. Along the line Bridge St.–Trinity St.–King's Parade (the area of special interest to the University) there is now only one large shop doing a general town and country trade. The remainder are smaller establishments catering mainly for the University and visitors. Moreover, retail trade near the centre of Cambridge has the peculiarity that the Fitzroy St. shopping centre has almost as many customers for some goods as has the older centre. The latter's predominance is in specialised goods, especially of the higher qualities. There are thus already two shopping centres in inner Cambridge, and when the new Chesterton Bridge and the spine relief route are completed traffic in the centre will be reduced and in time some eastward shift of trade will occur.

327 If Cambridge continues to grow in size some inconvenience may still result in term time from the jostling of University and non-University uses in the centre, and streets will still be narrow, and often crowded with pedestrians and cyclists if not cars. But the University also benefits from shops—especially those catering for its needs—and efficient and imaginative redevelopment could provide for shops of this kind as well as increasing College accommodation. Distances would be short, usually very short, and part of the everyday life of the town flowing past the Colleges would both maintain the traditional background of University life and contribute to its vitality.

328 Finally, although the largest new buildings must be kept outside the centre, there is no reason why lecture rooms and examination halls should not be sited in the centre—for example, on the east side of Bridge St., on the site of the University Press if the printing works move, and even in Green St. There will be room in time for a small new College on and near the site of the electricity station and another of moderate size could be placed on land near Merton Hall.

The Case for Removal West of the River

329 The argument for siting most new University and College buildings west of the river runs on the following lines:

More than half the Colleges form an almost continuous line from Magdalene to Peterhouse. The whole of the land west of the Backs should be reserved for the University, and new University buildings should be placed there, beginning with the land near the Backs road. The bulk of the Colleges would then have the main shopping centre on one side of them, and the Backs, with the new University and College buildings just beyond, on the other. This would be a very convenient arrangement, especially if Cambridge and the University are going to grow. A large mass of town traffic flows up and down the spine and would continue to do so without too many tributaries from the University. The mass of University traffic would be to and fro across the Backs; and treatment of the area as regards both traffic and buildings would have to recognise this fact, general traffic on the Backs road being minimised. It is inevitable that the University will grow in terms of buildings if not numbers, and in the next 50 or 75 years it may grow a very great deal. Nearness of buildings to one another will always be desirable in the University, but it should be a proximity which does not sacrifice the advantage of well-shaped sites, space for expansion of buildings, good lighting, quiet, fresh air, and freedom from traffic hazards. The first and most difficult step in a movement westwards was taken when the site for the Library was decided, and by siting future buildings in a half-circle round the Library all the advantages just mentioned could be obtained. To place new science buildings in the centre because the existing ones are there may prove grievously short-

sighted. It is the science buildings that are most likely to increase and they may do so with surprising speed, in number, size and diversity of form.

330 It may be that if the proposals now being put forward by the planning consultant for Chesterton Bridge, a spine relief road and an eastward shift of the main shopping area are accepted and carried out, the disadvantages of continued University development in the centre would be reduced. Nevertheless the University must bear in mind the possibility, to put it no higher, that these proposals will come to nothing or that their execution will hang fire for many years. It would therefore seem unwise to rely on action by others when a good solution can be said to lie wholly within the control of the University and Colleges. Moreover the location of new University buildings west of the Backs is not incompatible with other planning proposals. If the centre of University life shifted west, and the main commercial and traffic centres eastwards, the traditional centre would be able to fulfil the function to which it is best suited—that of a meeting ground between Town and Gown which would remain substantially unchanged.

331 The new University extension could be developed gradually, to provide first-class conditions for each building and cause a minimum of hardship to displaced residents and Colleges asked to seek new playing-fields. A skilful layout, taking advantage of existing trees and supplementing them by new planting, would enable a portion of the new buildings to be fairly high—say five or six floors—without harm to the general character of the area, and could thus provide for scientific buildings.

The Third Policy

332 The third policy of trying to locate new University buildings in groups according to function is less clear-cut than either of those just described and the arguments for it probably require for their full appreciation an intimate knowledge of the working of the University machine. These arguments, as we understand them, are as follows:

333 Since 1918 the bulk of the building work for the University as a whole, including nearly all the largest buildings, has been carried out by the University itself as distinguished from the Colleges. It is now recognised that this shift in building initiative will almost certainly be permanent and that the central building programme is likely both to be greater than the sum of new building by the separate Colleges and to present much more difficulty in framing and execution. It is also recognised that obtaining good sites for new University buildings has been hampered by the lack of a general plan for their development over a long period and by consequent failure to reserve suitable sites. A general plan of this kind is needed and the University intends to prepare one.

334 The plan would be concerned, first, with the desirable grouping of Departments in relation to one another, insofar as it is possible to foresee future needs. In particular, account would be taken of the movement of students, with the aim of keeping close together the lecture rooms and other teaching places attended by the larger bodies of students. The teaching and research accommodation required by certain Departments would be examined to see whether the two could be provided for in different buildings or parts of the town. Secondly, the plan would consider proposals for the extension or rehousing of Departments, especially the requirements of those whose need for new accommodation is most urgent, and would try to provide this accommodation in a way that will be a stepping-stone to the best long-term grouping.

335 The benefit of these enquiries to the University should be great. They will tend to build up a general body of agreement on what will probably be the best relationship between the buildings of Departments, and will thus both promote agreement on future location and help to secure the reservation of the most suitable sites. The two fields of enquiry cannot of course be kept separate. Present needs not only influence studies of the best long-term location; they also and inevitably supply much of the driving force for them.

336 The decisions reached must take account of a number of other matters: the intentions and hopes of Colleges, relations between the University and town, questions of architecture and amenity, existing location and the sites that could soon be made available. It may well be that after weighing the evidence the University will think it best that the existing location should be adhered to for one group of Departments and that in providing for others a new departure should be made. A policy embodying a number of decisions of this kind may not win the immediate support of those unfamiliar with the great complexity of the problems to be solved, and may even fail to separate town and University traffic as much as most people would wish—and yet still be the best.

337 Map 37 shows in *red hatching* the location of sites which the University has bought or has in mind for extensions and in *yellow hatching* the sites on which various Colleges may wish to build in the near or distant future.* The site on the Barton Road which the University holds as reserve building land is also shown. The map discloses general agreement among the Colleges that the advantages of building new accommodation on land in or immediately adjoining their *domus* outweigh those of building elsewhere. This view is held by the majority of the riverside Colleges as well as by the others and is both natural and inevitable. It is almost inconceivable that a College should abandon its original site, and this being so the administrative and social advantages of a concentration of accommodation are very great and are growing greater. For example, the cost of manning an additional porter's lodge is now over £1,000 a year.

338 The sites for proposed University buildings continue a step further the policy of locating teaching accommodation for the sciences on a line running south from the New Museums, and also show that it has been agreed to transfer a number of Arts buildings across the river to a site near the Library. A new development of significance is the decision to make a distinction between scientific buildings used mainly for research and other science buildings, some of the former being located on the Madingley Road site about a mile-and-a-half from the town centre. On balance therefore the developments proposed by the University in the near future disclose a westward shift.

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* The sites shown may not include all those on which Colleges may wish to build eventually, and it should be emphasised that intentions concerning some of those shown are qualified in many ways and sometimes do not amount to more than a distant aspiration.

Size of the University

339 There is no general agreement on the future size of the University. The Colleges as a whole appear unwilling to increase the numbers of their undergraduates, believing that this will lead to a decline of standards. Discussions with the Colleges in 1948 disclosed a 1947–48 undergraduate population of about 7,200 and a desired future population of 6,300. Some of the Colleges, however, admitted that it might become necessary to increase the number of their undergraduates in order to balance their budgets. All Colleges seem to expect an increase in the number of graduate research workers.

340 The possibility of a graduate College and a new women's College coming into existence before long has been mentioned to us on a number of occasions. There also appears to be a fairly general feeling that if a considerable increase in male students becomes necessary it should be provided for by the establishment of a new College, rather than by an increase in the size of existing Colleges or in the numbers of non-Collegiate students. Three hundred appeared to be commonly regarded as about the optimum number for the undergraduate body of a College.

341 It might therefore be assumed that the number of undergraduates will not grow much above 7,000 for the next five to ten years, but may thereafter grow slowly to 8,000 by the addition of new Colleges. An increase of 200 or 300 in graduate research workers seems probable within a shorter period.

342 The growth of the University and Colleges in terms of buildings is certain, if the resources are forthcoming, to be rapid and large. Study of the *University Reporter* for the last few years conveys the impression that almost every branch of the University is carrying on its work in congested conditions and that much of the main teaching accommodation is out of date. And to new accommodation for established Departments must be added provision for new Departments and institutions that are steadily coming into being—for example, a veterinary school, a department of applied economics, a graduates' club, a University health centre and an institute of education.

343 The Colleges have an equally urgent building programme. In 1937 there were in use 1,146 lodging-houses licensed by the University containing 2,746 sets of rooms. In the academic year 1948–49 the number had fallen to 871, containing 1,538 sets, despite a very large extension of the area within which undergraduates are allowed to live. There seems at present little hope of the pre-war number of lodgings being regained, and the Colleges are therefore very likely to be compelled to provide accommodation in College, or in other premises under their direct management, for a much larger proportion of undergraduates than before the war. Some of the additional accommodation may be obtained by adaptation of existing large houses, but most of it will require new building.

RECOMMENDATIONS

344 The preceding paragraphs have indicated the complexity of the problem of future University building development and give a general sketch of alternatives. They have also mentioned that the University administration is aware of the need for a general plan for development and is trying to prepare one based on the needs of Departments and on the grouping most likely to promote the efficient working of the University machine. In these circumstances it has seemed to us that our own recommendations should be confined to those matters where general planning principles apply to University development, and secondly to those points where University intentions may overlap or conflict with non-University development or with the needs of the town as a whole.

A reserve of land for the University

345 Our first recommendation is that a large reserve of land should be made for the future building needs of the University and Colleges. The growth of the town in the last thirty years has been quick and even down the west side of Cambridge sites are now quickly being taken up. It may be unlikely that University buildings will continue indefinitely to increase at the rate of the past 75 years. But it is possible, and enough land should be reserved to avoid any future entanglement of University and other uses such as now exists in parts of the central area. The reservation should be so located that even if there is a big increase in the number of University and College buildings most of them will still be fairly close together—say, within a square mile. We propose, in broad terms, that all land between Huntingdon and Barton Roads and west of the Backs should be treated as a reserve for this purpose. From the point of view of location this is the only choice for a large reserve, and it is land very suitable for University buildings. Subject to arrangements being made in regard to Section 85 of the 1947 Act, the considerable part of the land that will not be needed by the University and Colleges for a long time could be used in the meantime for other purposes—for example, for houses.

Western sites for new buildings

346 Our second recommendation, arising from the first, is that as a general principle sites on the west of the Backs road should be favoured for new buildings. Our grounds for this recommendation are general and are not based on the links between Departments nor on the routes followed by dons and students. Such studies would yield valuable evidence and we feel certain that sooner or later the University itself will wish to undertake them. On the evidence of existing plans an appreciable expansion westwards seems inevitable, including the proposed new Arts Building in Sidgwick Avenue, those for nuclear physics and associated studies, the proposed site for the veterinary school, and new buildings proposed by certain Colleges.

347 Secondly the siting of large University buildings in the west would assist the retention of a modest scale, a moderate height and bulk for all buildings—University and commercial—in the older centre of the town. Some big University buildings already exist in the centre on the New Museums and Downing sites; but it happens that these buildings are almost completely screened from the view of the passer-by on every street except one—Downing St.—and there are not many places from which they can even be seen rising above the roofs of lower buildings. The general architectural character of central Cambridge is almost wholly one of buildings of moderate height. If new and large University buildings are to be placed in the centre it is almost inevitable that they must flank main streets and be well in the public eye, and that they will have to be high. The Planning Authority might possibly desire to grant the University a latitude which is denied to all other developers, but such a policy would not be easily maintained, especially as regards the projects of Government Departments and public corporations.

348 Lastly, University traffic to buildings west of the river will run over routes which for most of their length are free of town traffic or carry little general traffic. Students from the nine western Colleges would merely have to cross the Backs and those from most of the remainder would only cross the centre of the town and not run up and down heavily trafficked streets. That there would be a benefit from this separation of University and town traffic seems certain, and it would be the greater if in time more students came to reside in Colleges or hostels. But we are anxious not to exaggerate the benefit. Undergraduates will always use public roads a great deal, even if not on the way to lectures; and the peacefulness of the Backs must necessarily be diminished as the proportion of western teaching accommodation grows.

Southward extension and Lensfield Road

349 The third recommendation, which again follows from those preceding is that, except in the circumstances mentioned below no large University building should be placed farther south than the Lensfield Road site for which the development plans are now being discussed. When we first considered the location of University buildings, the dilapidated condition of many buildings in New Town and the existence of the University Botanic Gardens on its southern edge suggested to us that in time a large part of New Town might suitably be used for University buildings. We have now changed our view, for three reasons.

350 Study of Cambridge traffic has convinced us that the most needed road improvement in Cambridge is the construction of the long-deferred Chesterton Bridge. If this is done Lensfield Road will become part of an important local traffic route. We further suggest that this route should be used to take A10 trunk traffic off the Backs until, at some perhaps distant date, an eastern bypass is completed. Thus students going to and from sites south of Lensfield Road would have to cross or mix with heavy local and through traffic. We think that the number of students who have to cross this route to daily lectures should not be greatly increased.

351 In the second place we propose, for the reasons given in paras. 213–214, that efforts should be made to arrest the outward sprawl of low-density housing. These cannot be successful unless inner residential districts, now becoming dilapidated, are redeveloped with modern dwellings. The prejudice against living in the inner districts* can most easily be removed by encouraging redevelopment of the most suitable areas and removing any threat of the intrusion of other uses which at present hangs over them. New Town is extremely suitable for redevelopment with modern houses and flats. It has the Commons and river on one side, the Botanic Gardens on another and from a third central shops and the railway station can be reached by bus in two or three minutes. At 70 persons per acre New Town could accommodate when fully redeveloped about 2,000 persons. This would represent a considerable saving of undeveloped land which would otherwise have to be taken for housing on the outskirts of the town.

352 Thirdly it seems to us that a large concentration of University buildings south of Lensfield Road and up to the Botanic Gardens would be at too great a distance from the headquarters of science on the New Museums site, to say nothing of sites for research buildings which may be developed out to the west. A main University extension westwards plus some filling out of the present wedge from Downing St. to Lensfield Road seems preferable to a considerable extension in two directions.

353 These three arguments, taken together, seem to us very strong. Nevertheless they cannot be called conclusive until set fairly against the University's need to provide for scientific training—need which is very urgent. A majority of Cambridge students are reading what may be called, in a general sense, the sciences. Close linkages exist, as regards movement of students, between the buildings on the New Museums and Downing sites, and will soon exist between buildings on these two sites and those to be built in Lensfield Road. When the new accommodation needed by all the scientific Departments within the next five or ten years has been worked out, it is probable that at least one more site able to carry a large amount of teaching accommodation will be found essential. The movements of students between various lectures and laboratories may make it necessary for this new site to be near the three others. This is obviously a problem on which light could be thrown by a study of the places now frequently attended by students reading scientific subjects.

354 If the University decides that a further site is needed and that the smooth working of the scientific Departments makes it essential for it to be found near the three other sites, the obvious first choice is the site now occupied by Addenbrooke's Hospital together with certain adjoining

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* See paras. 210–212.

land—since a scheme is now proposed for a new hospital on Trumpington Road. If, however, the Addenbrooke's site cannot be made available to the University, or cannot be made available in time, it will be very difficult to find another site north of Lensfield Road. The most suitable in our view is that bounded by Tennis Court Terrace, Tennis Court Road and Fitzwilliam St., where buildings up to 55 feet high could be screened by the retention of the buildings fronting on Trumpington St. But if this were done not more than two acres would be available for new development. Should this site prove too small the only alternative may be an extension southwards of the buildings proposed for the Lensfield Road site. We recommend that any such extension should be developed at a reasonably low density, in order to avoid overshadowing of houses and preserve a residential scale in what we propose should be a predominantly residential area. We propose also that Coronation St. should be the southern limit for the extension.

College extensions and new Colleges

355 For the reasons given elsewhere we believe that most of the shopping in central Cambridge will come to be carried on within an L-shaped area extending down the spine from Market St. to Downing St. and then turning east to Fitzroy St. *via* Emmanuel Road; and that as time goes on the eastern section will do a higher proportion of the total trade.

356 If the Committee accept our arguments and decide to encourage this distribution, there will be no demand for large shops down the west side of the central area, and we do not think that the interests of the general body of citizens would suffer from an increase of College accommodation along this line. The chief problems of rebuilding along Trinity St. and King's Parade and neighbouring streets will be those of architecture and building form, and these are considered later in this report.

357 Some of the Colleges will be able to site new buildings either in the central area or west of the river. When, in these cases, a considerable new extension is desired, we think that the balance of advantage will lie with a site west of the river. It is possible that a continued shortage of lodgings coupled with a high cost of building additions to Colleges up to the standard customary prewar, may bring into existence a new type of University building. We have in mind buildings of economical construction and finish, designed primarily to provide undergraduate accommodation for one or more Colleges, but which could be changed over into flats for dons or for the general public if this proved desirable. If any such buildings are built the best sites for them are likely to be in west Cambridge.

358 When the spine relief road is completed the land east of Bridge St., between the river and Jesus Lane, will be a very suitable site for garages and car parks and for some medium- or smaller-sized shops. The most suitable future use for the bulk of the land, however, is for College buildings—either a new College or extensions by the four Colleges which flank it.

359 The needs of Emmanuel College call for special mention. By the accident of the town's growth Emmanuel College lies across the main entry to the centre from the east and directly between the two principal shopping areas of the town. There is in our view no hope of reducing the traffic around three sides of Emmanuel. We believe it will increase. There is therefore the strongest of grounds for allowing Emmanuel to build any new buildings it may need in the future in the only quiet refuge left to it—the land between it and Park Terrace; and we hope that it will be possible to arrange this.

360 We have considered which sites would be the most suitable for new Colleges and we recommend those *hatched blue* on Map 37. We place these in the following order of preference:

1. *Storey's Way, West*
   A site of 36 acres which would accommodate the buildings and playing-fields of a large College. It is a little distant from the existing Colleges, but well placed if University development moves west. Madingley Road is Trunk Road A45 but does not at present carry a large amount of traffic.

2. *Storey's Way, East*
   A six-acre site which could accommodate a smaller College without playing-fields. Now in use as the kitchen garden of St. John's College.

3. The whole or a portion of the beautiful 11-acre site now occupied by " The Grove " and " Wychfield " in Huntingdon Road. The site has the disadvantage that it is on one of the town's main traffic routes, and its use for a College would therefore cause an additional mingling of town and University traffic if Huntingdon Road is used for access. On the other hand it would be possible to connect the site with the lower part of Storey's Way, or even with the Madingley Road, at a point nearly opposite Grange Road, and in time the bulk of the residents might use this southern entrance—especially for going to and from lectures.

4. *Wilberforce Road and Clarkson Road*
   An 11-acre site which has the advantage of being south of Madingley Road and would thus enable its residents to reach lecture rooms with very little use of heavily trafficked roads.

5. A site on the south side of the river opposite Magdalene. Within the next decade it is probable that the electricity power station will be removed, and as a good deal of neighbouring property is in a dilapidated condition, the building of a new riverside College would be possible. Traditional use of the riverside would favour College buildings on the site. There are, however, reasons which suggest that these could be better provided by an extension of Magdalene rather than by a new College.

CHAPTER FOUR

DEVELOPMENT IN THE CENTRE

POSSIBLE CHANGES

THE general character of the centre of Cambridge is mainly derived from the intermingling of the Colleges, mostly large and sometimes set back in gardens, with the other buildings, which are for the most part low in height and crowded on narrow streets. A noticeable proportion of all the buildings are of great beauty and many are at least old and picturesque. We have said earlier in this report that we hope that the special character of central Cambridge will be preserved as a unique blend of market town and Colleges. But every town which is alive is continuously changing, and may change a great deal in a comparatively short time.

362 Many of the non-University buildings in and near the centre are not only old, they are also in poor condition and even decrepit. The County Planning Department has prepared a map (not reproduced in this report) which places buildings in five classes according to their age and structural condition and related qualities. This map is based on a careful survey and shows that nearly a quarter of the non-University buildings in the centre would not normally be retained much longer, unless for æsthetic reasons or those of historic interest. If, therefore, forces making for change were strong, an appreciable part of the buildings in the centre might be swept away in a generation. The powers for preserving buildings contained in the 1947 Act may be used effectively to protect isolated buildings of merit and even some groups of buildings, but they could hardly extend protection to the general character of a whole district in the face of strong economic pressure. Nor do we think that they should do so.

363 Two forces of this kind might change the character of central Cambridge within a short period of years, especially if both were operating. The first is a strong demand for more commercial accommodation, mostly shops. The second is a similar demand for more College rooms. We consider the architectural problems of College expansion later in this chapter. Here we consider the larger question of commercial needs.

364 The commercial future of central Cambridge turns mainly on provision for central area shops, in that the siting of other buildings—cafés, cinemas, banks and offices—is greatly influenced by the location of shops of this kind. A central area shop may be defined as one which draws its customers from the whole town and that portion of the surrounding countryside which relies on the town for less common goods and services. At present these shops draw customers from the 86,000 people in the Borough and from 30,000 to 40,000 people living outside the Borough.*

365 Although establishments, chiefly shops, which supply occasional and specialised needs are the distinguishing feature of a central area, the shops in the centre of Cambridge also supply the regular needs of many customers. The importance of a shopping centre as regards foodstuffs and other necessities can be roughly judged by the number of families who buy their sugar there. Shops in the older centre of Cambridge (1A and 1B on Map 38) have 21,000 sugar registrations and the local population is about 6,000; so shoppers representing about 15,000 people probably come in to do their weekly shopping in the centre. The Fitzroy St. centre (2A and 2B on Map 38) has 16,500 sugar registrations and a local population of about 14,000; the surplus being therefore about 2,500. Undergraduates and others whose rations are handled by an institution are excluded from these figures.†

366 The volume of trade done in central area shops tended to grow in all towns in the inter-war period. The reasons for this include the great increase of motor transport, the spread of multiple and other large shops offering a wide choice of goods, and greater reliance on cleaners, garages and other service enterprises. A prosperous town like Cambridge would be expected to have had its full share of this increase; and in view of the big growth in population since 1937 and the doubling of the numbers of passengers carried by country buses, a further increase seemed probable when building resources allowed. We therefore decided to examine the pre-war and present shopping position, and to try to make some comparisons with other towns, in the hope that by so doing we would be able to estimate the future needs of commerce with an

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* Two estimates have been made of the "dependent rural" population of Cambridge. The first, by Mr. F. H. W. Green of the Ministry of Town and Country Planning, was based on 1939 populations and bus time-tables, and estimated the 1939 dependent rural population at 41,000. The second estimate, made by the Ministry of Town and Country Planning Regional Office in 1946, was based on sample enquiries in villages, and the population served by weekly visits to Cambridge was estimated at 30,000. A much larger population was thought to be served by occasional visits.

† Comparative sugar registration figures for local shopping centres are:—

1.	Mitcham's Corner	7,823
2.	Romsey Town	7,667
3.	Histon Road–Victoria Road–Castle Hill	7,657
4.	Mill Road West	6,509
5.	Cherry Hinton Road	4,629
6.	Hills Road North	4,575
7.	Newnham	3,799
8.	Old Chesterton	2,241
9.	Milton Road	2,136
10.	Trumpington	2,046
11.	Cherry Hinton (Village)	1,379
12.	Newmarket Road	1,228

accuracy sufficient for the broad guidance exercised by planning control.

DISTRIBUTION OF SHOPS

367 Map 38 shows the distribution of shops near the centre of Cambridge, and also shows theatres and cinemas, hotels, cafés and public houses. The shopping areas are divided on the map into four groups. 1A and 1B together comprise the " central area " of the town in the ordinary sense of the phrase, and also contain nearly all the famous buildings and street scenes of Cambridge. But in terms of shops alone Cambridge has a second centre in Fitzroy St. and Burleigh St. (2A), which contains a number of shops that by every test must be called true central area shops. We feel that the existence of this second centre is an asset and that it relieves pressure on the shops and streets in the older and principal centre.

368 A study of the shops in the principal centre (1A on Map 38) shows that those to the north and west are generally smaller in size and cater in the main for the University and for visitors, while those to the south and east tend to be larger and serve the whole town or town and county. This division is noticeable within each street block as well as in the centre as a whole, and serves as a reminder of how important location is in retail trade. Except for motor showrooms combined with garages (to which special conditions apply) virtually all the big shops lie within 200 yards of Christ's College entrance. The bigger shops in the second centre (2A) also tend to lie close together. Few of the shops in the outlying portions of the two centres (1B and 2B) are large, and an appreciable proportion of them do a trade that is largely local.

USE OF FLOOR SPACE NEAR THE CENTRE

369 In seeking an answer to the question of how much additional commercial accommodation would probably be needed near the centre of the town during the next 20 years, it was desirable to know how much accommodation was there already. The survey made by the County Planning Department during the last two years has provided full information on the amount and present use of all accommodation near the centre, and this information is set out in Table 15.

370 It will be seen that there are $9\frac{1}{3}$ million sq. ft. of floor space in the main centre (1A and 1B), of which $4\frac{1}{2}$ million are in use by the University and Colleges, and $1\frac{1}{2}$ million by non-University houses and flats. Shops (of all kinds) contain just over 1 million sq. ft., and commerce and industry of all kinds (including shops) occupy about $2\frac{3}{4}$ million sq. ft. In terms of percentages of total accommodation the University and Colleges occupy 48 per cent., shops 13, and commerce and industry of all kinds about 30. The figures for the smaller Fitzroy St. centre (2A) show that it contains about one-sixth of the central shopping space.*

371 In the older and principal shopping centre there are 548 separate shopping premises, each containing on the average 2,300 sq. ft. of floor space. This floor space includes window display, selling space, storage space attached to the shop, counting-houses, etc., and is therefore not as large as at first it may seem. 47 per cent. of the shops contain less than 1,000 sq. ft. and 69 per cent. less than 2,000 sq. ft. There are only 165 shops of over 2,000 sq. ft. and 103 over 3,000 sq. ft.

372 In very general terms one might therefore sum up the present position by saying that the two shopping centres supply the weekly needs of at least 35,000 people (probably many more) and the occasional needs of 120,000 and upwards; that they do this in less than $1\frac{1}{4}$ million sq. ft. of shopping space (since a number of the shops in the centre do a purely local business); and that probably the 103 largest shops do the lion's share of the trade.

PRE-WAR SHOPPING TRENDS

373 Table 15, which shows that the University and Colleges occupy nearly half of all accommodation near the centre, read together with Map 12—which shows how academic buildings surround the centre—may suggest on a first study that commerce has been cramped and crowded out by the University. That access to the principal commercial centre is made more difficult by the ring of University buildings is undoubtedly true. But we do not think it can be maintained that shopping and commerce in the centre have suffered because persons wanting to open new shops or offices have been unable, on account of the University and Colleges, to find suitable sites. In the first place, Table 15 shows that 16 per cent. of the floor space in the older centre is still used for ordinary residence. If demand for commercial space had been pushing hard against supply in the inter-war years this percentage would have been far smaller. Secondly, a study of the map of age and condition of buildings shows that there are plenty of sites occupied by decrepit buildings which could have been redeveloped with new shops and offices. These sites are not in the very best positions for shops, but a number are in good second-best positions, and one test of real demand for shops in a central area is whether developers have been ready to risk building at a little distance from the previous centre of trading values. We therefore formed the preliminary view that the amount of *additional* commercial accommodation really needed—in the sense that there would be firms willing and able to build or occupy it—would prove to be limited. In an attempt to confirm this view we have examined the evidence of the inter-war years.

374 Information given us by the Borough's Rating and Valuation Department shows that about 20 new shops were opened in the two centres (1A, 1B and 2A, 2B on Map 38) between 1920 and 1939—that is, shops built on sites not previously used for retail trade. In addition, 35 shops were completely rebuilt and may have increased their accommodation in some measure; and there were 14

* The figures in Table 15 may not do justice to the importance of the Fitzroy St.–Burleigh St. shopping centre, in that it contains two of the four largest shops in the town (exclusive of motor showrooms and garages).

extensions.* The number of shops in the principal centre (1A and 1B) did not increase at all, since demolitions and conversions from shopping use (21) outnumbered new shops (19). In accommodation there was certainly some net increase; but it was probably small. For example, even if one assumes that all the 19 new shops were of average size, and disregards all losses by demolition, etc., the gain is only 44,000 sq. ft. or under 4 per cent. of present shopping space.

375 Our second evidence was obtained from the Planning Department's advisory group on retail trade and associated problems, whose members have an expert knowledge of retail trade and the commercial property market in Cambridge. The group expressed the view that outside the few most favoured situations shops were not always easy to let before the war and there were always some vacancies. Offices were in similar case, and it was mentioned that one newly built block of offices, in an excellent position, remained unlet for a surprisingly long time.

Comparisons with other towns

376 We have also tried to make some comparison between central shopping facilities in Cambridge and those in other towns—to see whether, in the technical phrase, Cambridge is under-shopped or over-shopped. For this purpose we chose Worcester, a county town somewhat smaller than Cambridge, and Oxford. We obtained a large amount of information about commercial employees and numbers and kinds of shops in these two towns, both in their central areas and elsewhere. Unfortunately the methods of enumeration and classification on which the published figures for Worcester and Oxford were based differ in a number of ways, and we at length came to the conclusion that no valid comparison could be made. The figures did, however, suggest that there were fewer shops in proportion to population in the centre of Cambridge than in the central areas of the two other towns. If this is true Cambridge shops are probably somewhat larger, as the numbers employed are proportionately much the same in all three towns.

377 Our general conclusion is that commercial accommodation in the centre of Cambridge has increased very slowly and that in this Cambridge resembles other ancient towns. The true central area shop, as we have said, is one that serves the whole town and its dependent rural area. It requires a large shopping public, either because the wide range of its goods could not be maintained without a large turnover, or because its goods or services are narrowly specialised and are needed by the average family only at rare intervals. Such shops must have a central position, and they come into being slowly as the town grows, almost always by gradual displacement or conversion of shops serving more common needs or having only a small stock. In step with this process shops serving common needs tend to move to the suburbs where they are more conveniently placed for their customers. The essence of the matter, in our view, is that a modern central shopping centre has obtained its accommodation by conversion or reconstruction rather than by adding to what was there before; and, secondly, the increase in central shops in response to an increase in population is likely to be much less than the corresponding increase in shops serving daily or common needs. This contention seems to us to be confirmed in Cambridge by 80 new shops having been opened in suburban areas between the wars as compared with 19 in the older centre; and also, to some extent, by the loss of 21 shops in the older centre during the same period. We also note that shopping changes at Worcester between the wars followed the same pattern.

* In the same period about 80 new shops were opened in *local* shopping centres.

DEMAND FOR COMMERCIAL FLOOR SPACE

378 In the preceding paragraphs we have pursued the question of how much additional commercial accommodation is likely to be needed near the centre of the town in the next 20 to 30 years. Our general conclusion, after considerable enquiry, is that only a modest amount will be needed. It remains to try to assess what this amount will be, to consider where it could best be provided, and also (as a safeguard) to consider where further commercial buildings could be best placed if our estimate proves in time to have been too modest.

379 There is only slight evidence of recent demand for commercial accommodation. Two firms of estate agents were good enough to compare their lists of enquiries for commercial premises for the period 1946 to 1948, and informed us that the enquiries during that period were for 34 shops, totalling 40,000 sq. ft., and 49 offices totalling 12,000 sq. ft. It was thought by the advisory group on retail trade and associated problems that current demand was greater than these figures showed, especially for offices. One may therefore guess at present demand for accommodation in existing buildings as being of the order of 60,000 sq. ft. for shops and 30,000 sq. ft. for offices. To this figure for floor space which would be rented or bought if it were available, and may therefore eventually be built, we must add the additional floor space which would be provided almost at once by newcomers or existing firms if building resources allowed. Contemplated developments known to the County Planning Department suggest that 30,000–40,000 sq. ft. of *additional* accommodation might soon be provided in this way, most of it for shops.

380 We thus have a figure of demand—admittedly little more than a guess—running up to 100,000 sq. ft. for shops and to 40,000 sq. ft. for offices. 100,000 sq. ft. represents, by Cambridge standards, 10 large and 25 average-sized shops; and 40,000 sq. ft. of offices would house 10 large firms and 40 or 50 smaller. The figures also represent 8% and 10% respectively of all existing shops and offices in the two centres (1A, 1B and 2A on Map 38). There has been no commercial building in Cambridge for a decade and when building restrictions are

relaxed there will no doubt be a rush to carry out postponed schemes, and some increase in floor space will result. Nevertheless, bearing in mind that central shopping accommodation tends to increase only slowly, we think this estimate of demand in the next few years will turn out to have been liberal.

PROVISION FOR NEW COMMERCIAL BUILDINGS

381 If present demand is of this order, we believe that not more than 150,000 sq. ft. of additional shopping accommodation and 60,000 sq. ft. of additional offices will be needed near the centre of Cambridge in the next 20 years. When building restrictions are relaxed a large amount of commercial building will be put in hand. But a good deal of this rebuilding will take the form of replacing old accommodation by new. There will certainly be some net increase but we think not more than 3% or 4%. Thereafter additions to commercial space in the centre seem to us likely to occur slowly—unless preceded by some runaway increase in the population of Urban Cambridge. We have so far considered shops and offices —the two key uses in a central commercial area. There will also be some increase in hotels, public houses, cinemas, clubs and other commercial buildings that require a central position. In round figures therefore there may be a demand for 250,000 sq. ft. of additional commercial floor space near the centre during the next 20 years and the larger part of this will be for shops.

382 The question of where to put this new commercial space should be approached from a strictly commercial point of view. A firm building a large new shop will only be interested in sites near the place which is, or almost certainly soon will be, at the centre of retail trading values for the whole town or, more rarely, for the particular kind of trade in which the developer intends to engage. By no means all trade is done by large shops, but the location of these shops does greatly influence, if not determine, the relative values of shopping sites.

383 As in other towns, valuable shopping sites in Cambridge have tended in the last 20 years to become concentrated within a small area. There has been a shift away from Bridge St. and sites north of Green St. towards the Market St. to Emmanuel St. area—probably because of the pull of the bus station. The advisory group on retail trade have expressed the view that in the next decade the highest shopping values in Cambridge are likely to remain in this district. When they expressed this opinion the group were not aware of the recommendations made elsewhere in this report for a new bus station, and for the construction of New Emmanuel St., the new Guildhall St. and the spine relief road. We believe that if these recommendations are accepted and carried out they will powerfully reinforce the view of the advisory group and also extend the area of high values. In short, we believe that in the next decade developers who want to build or rebuild a large shop will seek first of all for a site within Area 1 on Map 39.

384 The redevelopment of land on the east side of St. Andrew's St., from Christ's Lane to Emmanuel St., and on either side of the proposed new Guildhall St. (see Map 17), with buildings four storeys high on street fronts, would provide at least 150,000 sq. ft. of additional shops and office space. Thus over half of the additional accommodation likely to be needed in the next 20 years could be provided in the commercially most desirable area and without appreciable change in its general character. The provision of most of this accommodation is certainly dependent on the construction of Guildhall St., but we think the arguments for Guildhall St. (see paras. 121–130) are so strong that this improvement may well be carried out even if other recommendations are not.

385 In the same period—the next 10 years—some large shops may be built in Fitzroy St. and Burleigh St. (marked 2 on Map 39). This district must be considered as a second central shopping area of Cambridge and we see no reason why its popularity should decline. On the contrary, if Chesterton Bridge is constructed local traffic along East Road will be much increased, and this can hardly fail to improve the trade done. Moreover, Fitzroy St. is well placed in being near three main traffic routes, in having a large car-park nearby and being at the centre of the built-up area of Cambridge—a factor which may well be influential in the long run. We provide in our Development Plan for some extension of the Fitzroy St.–Burleigh St. shopping centre. About 25,000 sq. ft. of additional shopping space has been allowed for; and if at the first quinquennial revision of the Plan this provision appears likely to be insufficient we would certainly agree with its being increased. We regard Fitzroy St. both as being well placed and also as a valuable relief for shopping pressure on the older centre.

386 We have been modest in our provision for new shopping space in Fitzroy St. because we think its long-term consequence cannot be judged until a decision is reached on the construction of the spine relief road, nor can it be certain until after the construction of at least the southern half of this road. If the spine relief is constructed and directly connected at its southern end with Downing St., heavy traffic will pass the proposed roundabout on Christ's Pieces. The older and principal shopping centre will be 200 yards or so west of this roundabout and Fitzroy St. 350 yards or so to the east. In these circumstances, we think that there will be a demand for the redevelopment for commerce of frontages on Emmanuel Road and Parker St. We recommend that if this demand is made it should be acceded to by the Committee under proper safeguard.

387 The property adjoining Emmanuel St. and Parker St. (3 on Map 39) is pleasing in appearance and for the most part in fair structural condition. The extensions just described in the older centre and in Fitzroy St. will provide for all the new commercial accommodation needed for some years and it would in our view be foolish to allow a single shop, or even one or two small shops, to be built prematurely in Emmanuel Road. But we recommend that when the southern section of the spine relief is

under construction the Committee should grant permission for commercial redevelopment in accordance with a suitable layout, provided that appreciable demand has by then made itself felt. Illustration 40 shows the first stage of a scheme for the redevelopment of Emmanuel Road–Parker St. with modern commercial buildings. We doubt whether there will be any demand for buildings of greater height than three storeys; and redevelopment to this height on street frontages would keep the scale of existing development, and allow in the first stage for about 100,000 sq. ft. of commercial buildings.

388 After the spine relief road has been completed from Histon Road corner to Drummer St. some additional new commercial accommodation may come into existence as part of rebuilding schemes at two other points, shown as 4 and 5 on Map 39, both of which will benefit to some extent by being on connections between the older centre and the spine relief. We do not expect shops aiming at a large turnover to choose either of these positions, but they would be suitable for garages, for certain specialist shops and for offices. Illustration 41 shows two stages of a possible redevelopment scheme near Bridge St. and the spine relief road.

DENSITY AND HEIGHT OF BUILDINGS

389 If the demand for additional commercial space is limited to the main shopping frontages in the older centre, the most obvious means of satisfying it would be to build higher buildings; and this would soon change the character of an area where most buildings are about four storeys above ground and most streets are narrow.

390 We do not think there will be a general desire for higher buildings in order to provide additional space. The new accommodation will be chiefly needed for shops, and shopkeepers are normally only interested in accommodation on the ground and first floors. Secondly, the additional accommodation needed will be, in our view, moderate in amount, and can be provided by redevelopment of the east side of St. Andrew's St. and in the new Guildhall St.—since we believe that Guildhall St. would soon become very attractive to commerce both by reason of its position and its good sites.

391 A demand for higher buildings may, however, arise when the time comes to replace the existing accommodation in the central street blocks. Some of these street blocks are very densely built. Map 42 and Table 16 show the comparative densities of building in each street block near the centre both by tones and by index figures called *Floor Space Indices.** The Floor Space Index is a measuring rod which enables densities of building and conditions flowing therefrom to be compared between sites or districts of any shape or size, and in different towns. Comparison of the indices of street blocks near the town centre with those in other towns shows that density of buildings is high for a town of the size of Cambridge. It is comparable with that at the centre of Leicester, a town of 280,000 inhabitants. Buildings three or four storeys high on street fronts are only compatible with high densities in the street block as a whole when land in the centre of the block has been entirely, or almost entirely, built over. This of course is what has happened near the centre of Cambridge. The land within blocks 2, 3, 4, 5 and 22 (see Map 42) is almost entirely covered with buildings, some only one storey in height above ground but mostly of two and three storeys.

392 This is not a matter of mere technical interest. It bears directly on the preservation of the present character of the famous streets near the centre. When the street blocks adjoining these streets come to be rebuilt—a process that will soon begin—it is desirable that their layout should be improved. For example, portions of buildings behind, as well as those on, street fronts should be well lighted and ventilated and present a low fire risk; and there should if possible be rear access for delivery of goods. Provision of these advantages will reduce the proportion of land that can be built on at ground level and may appreciably reduce the land covered by buildings more than one storey high above ground. It follows that the new buildings will either contain less accommodation than is contained in the present buildings or they will have to be higher. Put another way, the reduction of the Indices of blocks 2, 3U, 3E, 4, 6 and 7NE on Map 42 to 1.5 (which would probably enable reasonable improvements to be made in their layout, lighting, etc.) would mean that up to 250,000 sq. ft. of the floor space now existing in those blocks could not be reprovided in them when they are rebuilt, and would have to be provided somewhere else. Alternatively, if improvements are insisted upon but owners are allowed to replace their existing floor space, buildings now three or four storeys high might have to be made six or even seven storeys high.

393 In practice, a limitation of height near the centre is not likely to be strenuously opposed by the generality of developers. As we have mentioned earlier the most valuable shopping space in a building is that on the ground floor, with the basement and first floor as second best. Developers may desire to build one further floor, either for ancillary accommodation for a shop or for separate letting as offices. We believe that it will not pay the average developer to build more than three floors, or at most four floors, high. Only the exceptional shop can coax customers to go up several floors; and offices on the top floors of buildings of which the lower floors are used as shops have proved, at least in other towns, to be difficult to let. We think it more probable that the man who wants to build or rebuild a shop will go for maximum ground floor and basement space, preferably with rear access, and that if his existing site cannot supply his needs or be extended, he will look for a new site. We think it quite possible that sites in Guildhall St. may be taken in time by firms removing for these reasons from congested sites elsewhere.

394 There remains the exceptional developer. Although it will not pay the average developer to build high, it may

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* A Floor Space Index is the total floor space within the block, divided by the area of the land plus half the width of surrounding streets.

well pay the few developers of buildings that are out of the ordinary—a department store or office building that can run to a battery of lifts, a hotel, or post office or telephone exchange; and a dozen high buildings of this kind in prominent positions would greatly damage the present character of the central streets.

395 We have measured the heights on street fronts of many buildings in Cambridge and some of them are shown in Illustration 43. As a result of these studies, and for the reasons given in the preceding paragraphs, we recommend that the Committee should impose limits on the height of buildings near the centre of Cambridge. We propose that as a general guide to developers the sheer height of buildings within the inner ring* should be limited to 35 ft. on narrow streets and 45 ft. on wider streets. We also propose an unobstructed angle of set-back of 45 degrees, in both cases, and an overall limit of height of 55 ft. We have said that this limit should be announced as a general guide to developers because we do not consider a rigid rule-of-thumb control of height would be desirable in central Cambridge, where the differences between buildings play so large a part in its famous street scenes. Our intention is that authorised heights should be laid down for each street, and that a developer would then be free to seek the consent of the Committee, on grounds of architecture alone, to his building higher than the authorised height. This relaxation is especially important in relation to the overall or maximum height of buildings. The requirements as to rear access, daylighting and height on street frontage which have been proposed above, would normally result in the overall height of all buildings in the central area being limited to 55 feet at the most. There may, however, be occasions where public or University buildings should be allowed predominance; and there may be instances where, for architectural reasons, a building well set back from the street would be better designed with greater height in some part of it than with the whole of it rising to the height permitted by some arbitrary maximum. Rather than impose an arbitrary limit of height on all buildings we think it would be wise for the Committee to emphasise that this element in a building design will be considered as part of its general external appearance, and that special regard will be had in a town such as Cambridge, to the character of the design and the environment in which it is proposed to be placed.

396 We recommend, secondly, that the County Planning Department, in consultation with the Borough Engineer and Surveyor, should prepare an improved lay-out plan for the most densely built street blocks—those with a Floor Space Index of more than 1.5. These plans should take account of ownerships, existing buildings and their condition, and the height recommendations, and incorporate reasonable improvements in daylighting, access, plot shapes and as regards safety from fire. A person wishing to build or rebuild in one of these blocks, or two or more developers acting together, should, we suggest, be at liberty to propose variations in the Planning Department's layout which would be more suited to their needs while still achieving the scale of improvement proposed by the Department. When they have been fully rebuilt in this way—a process which will of course be spread over many years—we would expect the street blocks near the Town Centre to contain from 100,000 to 250,000 sq. ft. less floor space than they do now. But the remaining floor space would be fully useable, whereas today an appreciable amount is unused or little used owing to risk of fire and for other reasons. We expect, however, as we have mentioned earlier, that in course of time there will be some "overspill" from the congested blocks; first to Guildhall St. and perhaps later to Emmanuel Road.

* Chesterton Lane, Victoria Avenue, Emmanuel Road, Park Side, Gonville Place, Lensfield Road, Fen Causeway, Queen's Road.

DEVELOPMENT BY THE COLLEGES

397 The majority of the Colleges have expressed a desire to extend their buildings in the centre, and in a number of cases this would mean that buildings now occupied by shops and offices would be replaced, in the near or distant future, by College buildings. As the Colleges already occupy a large proportion of the land in the centre we have considered whether extensions contemplated would harm the commercial prosperity of the centre.

398 This is not an easy matter to judge. In trying to do so we think it essential to appreciate the process of change, described in para. 376, which is continually taking place in the centre of every growing and active town: the process by which more and more shops become specialised in one way or another, and the remainder tend to move out or fade out. In theory the loss of any shop may be held to diminish the attractiveness of a central shopping area, but in practice its prosperity depends, in our view, on the number of specialised shops and good sites for those shops. Office accommodation and good sites for offices are of somewhat less consequence.

399 The shopping sites that matter most in the older centre are on Sidney St., St. Andrew's St., Trinity St. and King's Parade, and those lying within the angle formed by these streets. In general we think that the commercial prosperity of the centre would suffer if there were any appreciable reduction of shopping frontage within this area. In particular, as regards extensions by the Colleges, we think it would be unfortunate if shopping frontages were diminished on St. John's St., Trinity St. and King's Parade. Almost all of the shops in these three streets supply University needs and those of visitors, and they are well placed between the Colleges and the shopping streets that do the mass of town and county trade.

400 As was to be expected, some of the adjoining Colleges have projects for extending their buildings, sooner or later, onto sites fronting on the three last-named streets. These extensions would be incompatible

with the streets being occupied by large shops, but we think it unlikely that a firm which intended to open a new shop, and aimed to do general town and county trade with a large turnover, would choose a site on the west side of the centre. Shops of this kind have been tending to move towards the south and east of the centre and a trend of this kind is hard to reverse. In short, as things now stand, we do not think an extension of Colleges on the St. John's St. to King's Parade line would deprive big, large-turnover shops of sites, because we do not believe that such shops would go there.

401 The retention of shops of moderate size in the three streets is compatible with an extension of College rooms. To a large extent the needs of the two uses are complementary. The accommodation most valuable for shops is that on ground floors, whereas ground floors in busy streets are unsuitable for College rooms. Provided therefore that the buildings are carefully designed to contain good shops as well as good rooms, we think an appreciable addition could be made to College living accommodation without detriment to the commercial life of the centre. And when unsatisfactory buildings such as the Divinity School come to be demolished it would be possible to increase the present length of shopping frontage.

402 Redevelopment along the line of the three streets, from the Round Church to Corpus, cannot be considered without reference to the architectural problems that it would raise. The route contains the most famous street scenes in Cambridge and for three generations has remained almost entirely unchanged. The view from every point along the route gains from the contrast between the romantic irregularity of the shops and houses, for the most part small, and the large balanced masses of the Colleges and University buildings. There will therefore be very many people—we count ourselves among their number—who will hope that redevelopment will not take place until it is clear that internal alteration would not enable the buildings to serve modern needs in a reasonably efficient manner. But it seems to us probable that this situation may arise, in regard to a number of the buildings, within a comparatively short time: within 10 rather than 20 years.

403 The Colleges (for virtually all the buildings are owned by the Colleges) will then face the question of the architectural form of the new buildings; and it is an exceedingly difficult one. We have considered it in relation to King's Parade, where the contrast between irregularity and formality, openness and close building, is seen in plainest terms. We think that the solution of trying to keep this contrast by rebuilding King's Parade in small units will be rejected. Such units would almost certainly be uneconomic and inconvenient for the purposes for which the new buildings will be needed, and any building which is out of step with the needs and spirit of its time is likely, to put it no stronger, to be an artistic failure. The alternative, in our view, is to rebuild in large units and to match the formality of King's College and the Senate House with a formality on the other side of the street.

404 The problem is one of great significance to the architectural future of the centre. Mr. W. P. Hunt, of the University School of Architecture, has made an independent study of it, and we hope that others will be sufficiently interested to make further essays in civic design on these lines. The difficulty and commonness of the problem in ancient towns would certainly make such studies worth while, apart from their peculiar importance for Cambridge.

CHAPTER FIVE

FUTURE PROCEDURE

THE previous chapters have not reviewed every planning problem of Urban Cambridge. Our proposals have dealt only slightly with the part of Urban Cambridge which lies outside the Borough, and have not mentioned at all some matters of consequence—for example, the general question of preservation of buildings, that of landscape design or improvements along the river, the Backs and the Commons, and the redevelopment of the Castle Hill area.* We hope, however, that the proposals have covered the things that will matter most, and together form a framework within which the main classes of development—houses and University buildings, road improvements and commerce—will be able to proceed in good relationship to one another. In the 20 years before 1939 something like eight million pounds were spent in Urban Cambridge on road works, public utilities and new buildings. Whatever economic conditions may be in the next 20 years it seems probable that an equal sum will be expended on further development of the same kinds—and probably a much larger one. We think there will be general agreement that when new development of this magnitude is impending, at Cambridge, there should exist some means by which it would be subject to public scrutiny and approval, as a whole as well as building by building. To provide for this is the main aim of the 1947 Act. Our proposals are intended to draw attention to the more important aspects of future development in and near Cambridge, and thus to serve as an agenda for the discussions of those authorities with whom the final decisions will rest.

406 The work of the County Planning Department during the past 18 months has made many people in Cambridge aware that a development plan is being prepared, and the proposals have already been circulated by the Committee to interested authorities and societies. As a natural result enquiries have been made concerning the authority which the proposals command and the periods of time within which they are likely to be carried out. We therefore conclude our report with a note on the present position, and try to make some forecast of future happenings.

407 We must make it clear, first of all, that up to the submission of this report our proposals as a whole† have not been approved, nor even considered, by the Planning Authority—the County Council. At an early stage in our work the Council, acting through its Town and Country Planning Committee, decided to defer its consideration of the proposals until they were complete. The Committee will thus begin consideration of the general body of our proposals free to change them or reject them in part or whole.

Local examination of the proposals

408 Looking to the future, it seems to us that the first use of the proposals will be as a means of co-ordinating the views of those who live and work in Cambridge: the local authorities, the University and other specially interested bodies, and the general public.

409 Agreement between local authorities is of the first consequence. The 1947 Act has laid upon the County Council the duty of preparing before 1951 a development plan for the County, of which that for Urban Cambridge will form a part, and by far the greater part. The Act requires a County Council to consult County districts in making its plan, but a much closer relationship than this is needed between the County and the Borough if the plan for Cambridge is to achieve the only success worth having—success in execution. Cambridge is of County Borough stature though not of County Borough status. The mass of future development in Cambridgeshire will be within the Borough. The Borough will be the purchasing authority under the Act and the executive authority for much of the actual building. In short, the County can make a plan but success or failure in its execution must inescapably lie within the control of the Borough.

410 In so exceptional a case the only right approach to the making of a plan for Cambridge is in our view that which has been taken by the County. The plan for the town and neighbourhood is being prepared before that for the rest of the County, in a manner differing only by a few formalities from that in use for County Boroughs. The great majority of the staff of the Planning Department have been working on Borough survey and planing. A planning consultant was appointed who had been chosen by the Borough and who, but for the accident of the passing of the Act, would almost certainly have been consultant to the Borough. Finally, the County Council has sought to ensure by Borough representation on the committees and sub-committees concerned that the preparation of the plan as well as its execution shall be one in which both County and Borough have a share.

411 The decision of the County Council on the plan is likely to be preceded and influenced by scrutiny of the proposals by the committees of the County and Borough and Chesterton Rural District which are charged with responsibility for particular services. We have tried to provide for the needs of these services—such as housing, education and others—and have taken account of past

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* On some of these subjects we intend to submit papers which may serve as appendices to this report.

† Certain items of the proposals have been considered by the Town and Country Planning Committee during the past year in connection with development applications, and, having been approved, may now be said to carry the authority of the Committee.

proposals and present intentions so far as we know them. It would not have been possible in the time available for us to discuss with the committees (of which about 20 have demands upon land) the provision we have made; nor, had it been possible, do we think it would have been proper to do so before our proposals were laid before the County Council. Land is now scarce around Cambridge and our provision for one service or facility necessarily took account of the needs of all the rest. The responsibility of deciding which claims shall have preference rests with the County Council, and we feel sure that discussions with the several committees, in so far as they are undertaken by the Planning Officer or ourselves, should take place under the general guidance of the Town and Country Planning Committee of the County Council and after they have had the opportunity of seeing our proposals as a whole. Arrangements for discussion with the various executive committees, and modification of the proposals in accordance with the results, will be the first exacting stage towards an agreed plan.

412 Accord between the Planning Authority and the University is as necessary as that between Planning Authority and the Borough. The prime function of Cambridge, nationally, is that of a University town. The University has a large programme of building in prospect, most of it to meet urgent needs. A great deal of the land in the Borough is owned by the University and Colleges and a very large acreage is likely to be reserved for academic purposes under Section 85 of the Act. The interest and influence of the University in future development is therefore great. In our view it is best to regard the County, Borough and University as partners in the enterprise. It certainly seems to us true to hold that any plan on which these three are agreed will go through. The converse is also likely to be true. Major opposition by either the Borough or the University will postpone almost indefinitely the production of a coherent framework for the large works of development and redevelopment of the next generation. But it will not, of course, postpone the works themselves: they will go on, whether well or badly placed.

413 Examination of the proposals by committees of local authorities, by the University and other specially interested local bodies, and consideration of representations by the County Council, are likely to occupy the first half of 1950. It is very desirable that formal objections at a later stage, which may call for public enquiries, be reduced to the smallest dimensions, and a fair study of all arguments and counter-proposals will take some time. Moreover the publication of this report will not take place much before the spring, and the Council do not wish to conclude their review before members of the general public have had time to examine the proposals and express their views. Experience in other towns suggests that steady progress towards the maximum of local agreement can be assisted by a well-chosen length of time for representations and discussions. The period should be long enough to allow all matters of consequence to be examined and short enough to discourage any postponement of action by those who want to make their views known to the Council. In this connection the circulation of the reports to interested authorities and societies directly they became available should prove very helpful. We hope it will not prove necessary, at this stage, for views or agreements to be formally ratified by councils or boards which meet only at rare intervals.

414 When the Town and Country Planning Committee have concluded their review of the proposals and suggested amendments, on behalf of the Council, the normal procedure would be for the County Council to pass a resolution to prepare a plan, under Section 5 (5) of the Act, for submission to the Minister—the plan being based on the proposals as amended by the Committee. It seems to us unlikely that this stage will be reached before October, 1950.

415 The County Council may, however, desire to take action on one of our proposals at an earlier date. Reference has been made earlier in this report* to the difficulty of finding suitable and available sites for small workshops and similar enterprises, and a recommendation was made that the Borough should acquire two or three small sites for this purpose, under the powers contained in Section 38 (2) of the Act. On the instructions of the Town and Country Planning Committee possible sites are now being examined, and it may be that within the next nine months the County Council, in agreement with the Borough, will seek the Minister's approval for purchase.

Discussions with Government Departments

416 It seems probable that what may prove to be the major decisions concerning the future of Cambridge will be taken during the period between the passing of the County Council's resolution to prepare a plan and its formal submission to the Minister for his approval. The Ministry of Town and Country Planning has made arrangements for those aspects of a development plan which concern Government Departments to be examined by those Departments, through the agency of its Regional Office, before the plan is formally submitted. By full use of these arrangements it is intended that the plan will have been approved by all interested Departments before its submission, and thus that formal submission will be speedily followed by approval.

417 The importance of the attitude of Government Departments towards the Cambridge proposals needs small emphasis. We have proposed that a resolute attempt should be made to slow down the rate of increase of the population of Urban Cambridge. If this proposal is accepted by the County Council and supported by the Borough and University it will be necessary to ask for the help of Government Departments to make it effective, for without their full and continued co-operation a slowing down will be impracticable. It would be necessary to ask not only that the Board of Trade should seek to divert new mass-productive capacity from Cambridge to

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* Paras. 293–295.

peripheral towns or farther afield, but also that all Departments should agree to limit severely their own offers of additional jobs in the Cambridge district. In the past, negotiations between a Planning Authority and Departments concerning a Development Plan have usually turned on provision in the plan for the Departments' requirements; and it must be remembered that Departments are placed by the Act in a very privileged position. For a Planning Authority to ask for a contribution of the kind indicated from Government Departments is something quite new; and will call for unanimity and strong arguments on the part of Cambridge and a very full measure of goodwill from the Government.

Designated Areas

418 Another part of the work during the period before submission of the plan will be that of choosing the areas of land which should be designated as subject to compulsory acquisition.

419 Cambridge has no areas of war damage and no extensive areas of dilapidated or derelict property of which redevelopment is likely to be put in hand within ten years. There will be therefore, as we see it, no case for designation of large areas of land other than those needed for houses, schools and hospitals and similar purposes during the next few years. We have, however, suggested in earlier chapters* that the Committee should designate three areas of land, under Section 5 (2) (C) of the Act, in order to ensure that they are redeveloped for the purposes recommended within a reasonably short period of years. These areas are:—

(i) The major part or the whole of the land bounded by Petty Cury, St. Andrew's St., Downing St. and Corn Exchange St.;

(ii) The land between Christ's Lane and the North Court of Emmanuel College, including the sites of Nos. 63–70 St. Andrew's St.;

(iii) Land on either side of East Road, amounting to about 9 acres in all, and shown on Map 27.

All three areas contain an appreciable proportion of dilapidated property or vacant land. The redevelopment of the first two is fundamental to our proposals for improvement in the centre, and the third is the most suitable point at which to begin redevelopment of the East Road district with modern dwellings, and one for which, because of the dilapidated property it contains, a number of applications have been received for commercial and industrial development. Unless the land is designated in the plan its reservation for housing cannot long be maintained. The three areas are all small but in our view they have a value for the future well-being of Cambridge out of proportion to their size.

420 In addition, the Committee may think it desirable to consider the designation of two further areas. The first of these is the partially derelict land on the south side of Newmarket Road between Coldham's Lane and the railway bridge. This site, of about 30 acres, is largely occupied by the old brick clay-pit and brickworks and is a considerable disfigurement to Cambridge. We have proposed that the site should be used for industry, but there is no doubt that as things now stand its reclamation is likely to be indefinitely delayed and its attraction for industry confined to sorters of scrap and similar undertakings. If, however, it were in the ownership of the Borough, the best method of filling and cleaning up could be decided upon and slowly executed, and would result in 20 or 30 years' time in a valuable site being available for redevelopment.

421 The second additional area is that on either side of the railway between York St. and Cromwell Road. We propose that this land should be reserved for the use of larger factories, now on sites in central districts, when they come to rebuild. These factories may not wish to rebuild for some years, in some cases for many years, but their eventual removal would be much easier to arrange if a good new site can be offered them. The land at the moment is largely used for allotments and it could either remain in that use until needed for factories, or be let on short leases for storage and maintenance yards or similar purposes.

Submission and approval

422 Discussions with Government Departments, decisions on land to be designated and other matters preliminary to submission of the plan to the Minister, are likely to occupy the remainder of 1950, and formal submission of the plan may therefore take place early in 1951.

423 After submission of the plan a period must be allowed during which outstanding objections may be notified to the Minister, who will then examine the plan and hold such public enquiries or hearings as seem necessary for the investigation of controversial proposals. Finally, the Minister's approval may be given to the plan —or to the plan amended as he sees fit—at some time in 1951.

424 The stages and the time-table outlined in the preceding paragraphs represent our own views and are included merely to give an indication of probable events. It is possible that the time-table may be a little shorter and more probable that it will be somewhat longer; but it seems reasonably certain that the plan for Urban Cambridge will be approved by the end of 1951, provided always that no major disagreement occurs between the County and the Borough.

CONCLUSION

425 We hope that our proposals may form a general framework for future development in and near Cambridge—development on which eight million pounds, and probably much more, will be spent in the next 20 years.

* Paras. 126, 134, and 252.

The Town and Country Planning Committee of the County Council is likely to receive during the next few months many criticisms, objections and counter-proposals, which it will be their exacting duty to review. This duty may perhaps be lightened if the tests applied by the Committee—both to the proposals and objections or amendments—are those suited to a general planning framework.

426 We have suggested that an attempt should be made to keep the population of Urban Cambridge to a level that will retain the general advantages of a medium-sized town and the special advantages of Cambridge, and that future development should be compact rather than sprawling. We have tried to find ways in which these things could be done while providing for the future needs of the University, for houses, for commerce and existing industry in suitable places and on a suitable scale. We have also tried to find ways in which through traffic may be led round the town and the centre. We would emphasise that there is nothing grandiose in our proposals. We have provided for no more houses or University buildings than are certain to be needed, and our road proposals call for much smaller lengths of new construction than would a ring of bypasses far out from the town. In addition, all our new roads would be used at once by both local and trunk traffic, and in most cases by heavy traffic. We therefore feel we have proposed nothing that is out of scale with the town.

427 There remains the question of sequence of operations, which is closely linked with cost. At the present moment there is a very widespread feeling that it may be necessary to keep expenditure on new development and public works in this country to a low level during the next ten and perhaps for the next twenty years. This may well be so. But it by no means follows that a town should not plan for improvements and future development in scale with its present size and inter-war improvements: still less does it follow that a plan which calls for the expenditure of appreciable sums for its full execution is, on that account, a bad plan. We wish to draw this point to the particular attention of the Committee, since unless it is appreciated there is some danger of the proposals being misjudged. It is a point that is well exemplified by our proposals for road improvements.

428 As has been stated, we have sought to provide for no further general development of the town than seems certain to occur. For example we have provided land for 4,550 new dwellings and for certain new University and College buildings. The 4,550 dwellings are a minimum demand but would cost about £6,000,000 at current prices. This is a minimum programme which takes account only of present needs. £2,000,000 seems to us a conservative estimate of building investment by the University and Colleges in the next decade, and even a minimum of schools, hospitals, post offices, railway improvements and other buildings is likely to add on another £2,000,000. Thus, unless most severe restrictions are enforced, very large amounts are likely to be invested in building development in Cambridge in the period covered by our plan. Moreover, one must bear in mind that severe cuts may be enforced for two or three years, possibly for four or five, but only very rarely (in times of peace) for longer; and they are inevitably succeeded, as a building history of 1930–35 shows, by a scramble to overtake arrears. It is with these things in mind that we have tried to provide an improved road framework which will serve both new development and the Cambridge that already exists in an efficient but not luxurious manner. Our main aims have been to lead trunk traffic clear of the inner districts of the town and to relieve the centre of local-through traffic. It therefore seems to us that the proposals should be judged by some such standards as these: whether the things themselves are worth doing; whether the cost of doing them in the way we suggest would be reasonably in scale with pre-war improvements; and whether the same aims could be obtained more cheaply. May we also recollect past events? If in 1920, a year of slump, a balanced plan of road improvements and new roads, to cost a million pounds, had been submitted to the County Council or the Borough, it might well have been dismissed as visionary. Yet, as near as we can calculate, one million pounds was the sum that was in fact spent on road improvements and new roads of all kinds in the Borough between 1920 and 1940.

429 If the proposals survive these tests, the remaining decisions seem clearly those of sequence: whether the town would gain more general benefit by building Chesterton Bridge or Guildhall St., the spine relief road or the western boundary road. Once the proposals have been agreed to be in scale with the town's needs, the rate at which they are carried out becomes a secondary matter. In our table of comparative expenditure we have assumed a period of 20 years as reasonable for the execution of our main proposals. This assumes the same rate of progress, in terms of works, as before the recent war. If this is thought too optimistic by the Committee a longer period may be of course substituted.

430 Our other proposals are submitted to the Committee with the same hope that their scale, the location of the different developments and—where appropriate—their sequence, will be agreed between the County and the Borough with the support of the University. This agreement on a general framework for the future Cambridge has been the end to which all the proposals have been directed; and, if it is not realised, all of them, whether good or bad in themselves, will be of no account.

TABLE 1

Comparative Expenditure on Road Improvements

The Table distributes the sum of £1,575,000 (see paras. 8–11) among the improvements proposed in the report. The sums set against the various works are comparative. They distinguish between cheap and costly improvements and should enable a decision to be taken on whether a particular improvement would be worth while. The sum allocated to any individual improvement must not however be taken as an accurate estimate of its cost. Such an estimate could be prepared only after detailed examination of properties affected, subsoil conditions and other factors. Nevertheless it is believed that the total sum allocated to the works in each stage is likely to prove sufficiently accurate for the Committee to judge their comparative value. It should further be noted that the Table is concerned only with road improvements. Where a road improvement forms part of a larger re-development scheme the sum allocated in the Table is a *contribution* to the total cost. Such sums are marked in the Table with an asterisk *.

Reference to Paragraphs of Report	IMPROVEMENT	1st Stage 5 Years (1951–55)	2nd Stage 7 Years (1956–62)	3rd Stage 7 Years (1963–69)
		£	£	£
29, 31	East Cambridge bypass. Coldham's Lane to Newmarket Road	75,000	—	—
	WEST CAMBRIDGE :			
48–50, 60	New West Road from Barton Road to Madingley Road; and Observatory Road from Madingley Road to Huntingdon Road ..	—	80,000	—
51–55, 60	New road and bridge from Trumpington Road to Barton Road *via* Chaucer Road, including improvements to the two junctions ..	—	—	100,000
56, 57, 60	Double-carriageway entrances to the Backs road	—	—	5,000
58, 60	New access road and improvements from nuclear research site eastwards to the Backs road	5,000*	5,000*	—
59, 60	Widening of Sidgwick Avenue and improvements to its junction with the Backs road	7,500*	7,500*	—
	EAST CAMBRIDGE :			
65–68, 70	New route from Milton Road to Newmarket Road including Chesterton Bridge	100,000	—	—
69, 70	New roundabout at Newmarket Road—East Road junction	10,000*	—	10,000*
72, 76	Widening and other improvements to East Road	50,000*	25,000*	25,000*
73, 74, 76	Partly new route from Newmarket Road to Mill Road	—	25,000*	25,000*
75, 76	Improvements to Mill Road (exclusive of new railway bridge)	—	10,000*	40,000*
	RAILWAY STATION :			
78, 81	Footbridge or subway access from the east, including cycle store and car park	10,000*	—	—
79, 81	New forecourt	—	25,000*	25,000*
80, 81	New road between Hills Road (Brooklands Avenue) and Station Road	—	—	35,000
	OTHER IMPROVEMENTS IN EAST AND SOUTH-EAST CAMBRIDGE :			
83, 88	Four Lamps roundabout : improvements..	—	—	20,000
84, 85, 88	Mitcham's Corner and Victoria Bridge approach : improvements ..	—	5,000*	5,000*
86–88	New Hills Road railway bridge and ancillary works	—	50,000*	—
86–88	New Mill Road railway bridge and ancillary works	—	—	50,000*
	SPINE RELIEF ROUTE :			
120	Preliminary work	20,000	—	—
114–118, 120	New route from Chesterton Lane to Jesus Lane, including the new bridge	—	125,000	—
112, 119, 120	New route from Jesus Lane to Drummer Street (excluding new bus station), and roundabout	—	40,000	—
116–118, 120	New route from Histon Road corner to Chesterton Lane, including two new roundabouts	—	—	125,000
118, 120	Improvements to existing access roads	—	10,000*	15,000*
124, 128–130	THE PROPOSED NEW GUILDHALL STREET :			
	1st Stage	25,000*	—	—
	2nd Stage	—	25,000*	—
	3rd Stage	—	—	10,000*
132, 134, 137	New bus station	25,000*	—	—
133, 137	New roundabout and ancillary works in Drummer Street	—	25,000	—
	CROSS-TOWN ROUTE :			
140, 152	Improvements to Emmanuel Street	—	30,000	—
142–144, 152	Formation of New Emmanuel Street	—	60,000*	—
145–152	New route from Sidgwick Avenue to Downing Street *via* Mill Lane, including a new river bridge	—	—	125,000
142, 170, 171	Miscellaneous small improvements at south-east corner of Downing Street, Joshua Taylor's corner, south-east corner of Market Hill, etc.	20,000	20,000	20,000
	Totals for each stage	£372,500	£569,500	£633,000
	Grand Total	£1,575,000		

TABLE 2

Population Growth since 1851

Year	The Borough*	Outside the Borough	Urban Cambridge		Rate of Increase per year : Persons
			Total	% increase† over previous year of count	
1851	27,815	14,664	42,479	—	—
1871	30,078	17,284	47,362	11·5	244
1901	38,379	24,168	62,547	32·1	506
1911	40,027	29,382	69,409	11·0	686
1921‡	59,264	14,349	73,613	6·1	420
1931‡	70,169	13,861	84,030	14·2	1,041
Estimated mid-1948	86,336	17,679	104,015	23·8	1,176

* Undergraduates : in 1911 the Census was taken during the Easter vacation and few undergraduates were up. In 1921 it was taken after full term but a number of undergraduates were still in the town. At other dates the Census was taken in full term, and the estimated figure for 1948 includes undergraduates.

† N.B.—These percentages refer to varying periods of time and this should be taken into account when comparisons are made. Rates of increase *per year*, given in the last column, show a truer comparative picture of the growth of Urban Cambridge.

‡ Boundary changes : two extensions of the Borough have occurred : in 1912 when Chesterton Urban District was amalgamated with Cambridge Borough ; and in 1934 when the whole of Cherry Hinton parish and parts of other parishes were brought into the Borough. Figures for Urban Cambridge are unaffected by these changes and are comparable throughout. Figures for the Borough and the rest of Urban Cambridge are not strictly comparable. The Borough figures for 1931 are revised ones issued after the 1934 boundary change and therefore relate to the same area as the 1948 estimates.

TABLE 3

Comparative Growth of Urban Cambridge, Great Britain, and London and Home Counties

Percentage Increases of Population Between Various Years

Area	Percentage Increases				
	1911	1921	1931	1937	1948
Great Britain	—	4·7	4·8	2·6	5·8
London and Home Counties*	—	4·4	10·8	6·5	0·6
URBAN CAMBRIDGE	—	6·1	14·2	6·5†	16·2

* The Home Counties are here taken, as in the Barlow Report, as Bedfordshire, Buckinghamshire, Essex, Hertfordshire, Kent, Middlesex and Surrey.

† Urban Cambridge 1937. The population of Cambridge Borough has been taken from the Registrar General's Report for the year. The population of the rest of Urban Cambridge at that date has been estimated from the number of electors in each parish in 1937.

TABLE 4

Age and Sex of Resident Population Mid-1948

A. URBAN CAMBRIDGE: AGE DISTRIBUTIONS COMPARED WITH ENGLAND AND WALES.

Age	Urban Cambridge			England and Wales		
	Male	Female	All	Male	Female	All
0–15 ..	222	187	204	234	204	218
15–45 ..	437	428	432	441	431	436
45–65 ..	236	257	248	230	245	238
65 + ..	104	128	116	96	120	109
Total..	1,000	1,000	1,000	1,000	1,000	1,000

B. URBAN CAMBRIDGE: PROPORTION OF WOMEN IN THE POPULATION.

Age	No. of Women per 1,000 in each Age-group	
	Urban Cambridge	England and Wales
0–15 ..	497·7	489·5
15–45 ..	534·5	517·8
45–65 ..	559·9	539·1
65 + ..	591·5	580·7

C. DETAILED AGE-STRUCTURE OF THE BOROUGH AND OF URBAN CAMBRIDGE

Age	Cambridge Borough		Urban Cambridge	
	Males	Females	Males	Females
0– ..	3,240	3,280	3,990	3,940
5– ..	2,370	2,170	2,950	2,710
10– ..	2,270	2,360	2,710	2,910
15– ..	2,538	2,300	3,023	2,610
20– ..	2,470	3,040	2,930	3,480
25– ..	2,690	3,540	3,180	4,060
30– ..	2,650	2,940	3,050	3,510
35– ..	3,190	3,470	3,750	4,320
40– ..	2,960	3,030	3,720	3,840
45– ..	2,400	3,270	3,040	3,920
50– ..	2,160	2,730	2,580	3,250
55– ..	2,040	2,470	2,440	3,020
60– ..	1,880	2,360	2,220	2,890
65– ..	1,520	1,880	1,770	2,330
70– ..	1,135	1,401	1,250	1,699
75– ..	666	1,087	816	1,300
80– ..	469	972	674	1,201
Total ..	36,648	42,300	44,093	50,990
All persons	78,948		95,083	

Source : Sample Population Survey of Cambridgeshire mid-1948.

The figures for Cambridge given above exclude students, children at boarding schools and inmates of mental homes. As the year of birth only was obtained, the original age-groups were 0–4½ years, 4½–9½ years . . . etc. Adjustments have been made for this, and the figures for males aged 15–19 have been appropriately increased to include conscripts.

TABLE 5

Neighbourhood Densities in the Borough

Area Number and Description	Acreage		Population					Gross neighbourhood density : Persons per acre
	Total	Developed*	Private Families	Institutions	University Students	Other Colleges	Total	
1. Commercial core	36	36	710	—	184	—	894	25
2. Predominantly University	182	182	970	230	2,615	—	3,815	21
3. Inner Ring Residential ..	240	240	4,510	—	1,536	61	6,107	25
4. „ „ „ ..	497	497	13,760	80	496	—	14,336	29
5. „ „ „ ..	239	239	5,660	48	319	82	6,109	26
6. Outer Ring Residential ..	877	479	7,960	—	134	—	8,094	16
7. „ „ „ ..	783	553	9,920	110	243	—	10,273	19
8. „ „ „ ..	578	167	2,480	—	8	—	2,488	15
9. „ „ „ ..	345	345	9,080	30	28	—	9,138	27
10. „ „ „ ..	1,616	965	10,710	275	143	313	11,441	12
11. „ „ „ ..	142	166	1,120	—	156	—	1,276	8
12. „ „ „ ..	962	557	2,270	—	604	51	2,925	5
13. „ „ „ ..	771	377	3,220	—	128	72	3,420	9
14. „ „ „ ..	1,707	621	3,790	475	59	—	4,324	7
15.† „ „ „ ..	1,085	—	1,690	—	6	—	1,696	Village structure
Whole Borough	10,060	5,424‡	77,850	1,248	6,659	579	86,336	15·9‡

* Includes everything except agricultural and railway land.

† No gross neighbourhood density has been calculated for Cherry Hinton village, which is still rural in character.

‡ Excluding Cherry Hinton village.

Area numbers refer to those shown in *Red* on Map 24.

TABLE 6

Net Densities and Accommodation Indices in Twelve Sectors of the Borough

Sector	Residential Acreage	Population including Students	Students		Net density persons per acre	Habitable Rooms		Accommodation Index. Persons per room (in term).
			Number	% of whole population		Total	No. per acre	
A	10·6	933	263	28·2	87·8	1,579	149	0·6
B	37·5	3,071	351	11·4	81·8	4,438	118	0·7
C	26·0	2,055	95	4·6	78·9	2,956	114	0·7
D	100·0	6,729	59	0·9	67·3	9,124	91	0·7
E	43·9	2,439	189	7·8	55·6	3,884	89	0·6
F	100·7	5,311	21	0·4	52·7	9,215	92	0·6
G	9·2	449	9	2·0	48·5	632	68	0·7
H	51·5	2,171	51	2·4	42·1	3,240	63	0·7
I	77·6	3,137	6	0·2	40·4	3,894	50	0·8
J	88·2	2,319	29	1·2	26·3	3,190	36	0·7
K	169·9	3,628	68	1·9	21·3	5,717	34	0·6
L	135·5	892	72	8·1	6·5	1,942	14	0·5

Sectors A, B, C etc., refer to those shown in *Black* on Map 24.

TABLE 7

Open Spaces in the Borough

	Acres	*Acres*
Public Open Spaces		
Commons	226	399
Recreation Grounds	173	
Allotments		
Permanent	165	256
On leased land	24	
Temporary	44	
Private	188	
Private Open Space (excluding gardens, etc., immediately adjoining buildings)		
University and College Playing-fields	275	658
Club Playing-fields	46	
School Playing-fields	154	
Other private open space (including the Backs, Fellows' and Masters' Gardens, etc.)	183	

Including commons and recreation grounds only, Cambridge has 4·6 acres of public open space per 1,000 population. But this figure does not do justice to the amount of unbuilt-on land accessible to the Cambridge public for one or other form of recreation. Much private open space is open to the public for walks and sight-seeing, and allotments are numerous and much used. The river and its banks attract large numbers in summer, while many public footpaths and rights-of-way can be followed some miles into the countryside.

TABLE 8

Houses in Six Special Areas in the Borough

AREAS	1 Good		2 Below Standard		3 Short Life		4 No Life		TOTAL	
Area A. (Quayside and Thompson's Lane to Jesus Lane) ..	107	41%	75	29%	25	10%	53	20%	260	100%
Area B. Plus triangle at corner of East Road, Newmarket Road (i.e. Maids Causeway—Newmarket Road to Parkside) ..	195	16%	308	25%	432	35%	292	24%	1227	100%
Area C. Plus Brookside (i.e. Lensfield Road to Bateman Street)	174	25%	166	23%	194	28%	173	24%	707	100%
Area D. (East Road to Railway, Newmarket Road to Mill Road)	394	19%	391	18%	971	46%	370	17%	2126	100%
Area G. (Castle Hill to Mount Pleasant)	45	25%	31	17%	22	12%	84	46%	182	100%
Jesus Lane—King Street area	54	30%	17	9%	52	29%	59	32%	182	100%
TOTALS for six areas given above	969		988		1,696		1,031		4,684	
TOTALS for whole Borough	13,023		4,913		3,266		1,428		22,630	

Areas A, B, C, etc. refer to those shown in *Black* on Map 24. Percentages are of the total number of houses in each area.

TABLE 9

Demolition and Clearances (Dwellings only) Proposed in the Borough during the Period 1951–62

	IMPROVEMENT	Class of Dwelling				
		I	II	III	IV	Total
Minimum required for road improvements proposed for the 1st and 2nd Stages (1951–55 and 1956–62) in chapter 1.	WEST CAMBRIDGE. New West Road	3	—	—	—	3
	EAST CAMBRIDGE. Milton Road to Newmarket Road	3	—	—	—	3
	Roundabouts at Newmarket Road..	1	—	1	5	7
	Newmarket Road to Mill Road	1	3	11	25	40
	RAILWAY STATION. New Forecourt	—	3	—	—	3
	SPINE RELIEF. Chesterton Road to Drummer Street	1	1	—	6	8
	NEW BUS STATION	—	5	3	6	14
	GUILDHALL STREET	6	5	22	6	39
	EMMANUEL STREET widening..	—	—	2	4	6
	NEW EMMANUEL STREET	—	2	—	—	2
		15	19	39	52	125
	WIDENING EAST ROAD	1	12	4	36	53
		16	31	43	88	178

	STREET	Class of Dwelling				
		I	II	III	IV	Total
Minimum required for improvements to road pattern in area north-west of East Road during the same period.	Willow Place	—	—	—	5	5
	James Street	—	—	1	—	1
	Fitzroy Street	—	—	4	6	10
	„ „	1	2	—	10	13
	Wellington Street	—	1	6	9	16
	Fitzroy Street (Severn Place)	—	1	—	—	1
	Gold Street	—	—	6	—	6
	Burleigh Street	—	—	—	3	3
	Adam and Eve Row	—	—	3	27	30
	East Road (North side)	1	—	—	—	1
	City Road	—	—	3	—	3
	Eden Street	—	2	3	—	5
	Elm Street	1	—	—	1	2
		3	6	26	61	96

TABLE 9 (*continued*)

	STREET	Class of Dwelling				
		I	II	III	IV	Total
Minimum required for redevelopment of one area south-east of East Road during the same period.	Staffordshire Street	2	1	35	16	54
	Gas Lane	—	2	—	5	7
	Leader's Row	—	—	—	11	11
	Smart's Row	—	—	—	14	14
	Brewhouse Lane	—	—	—	2	2
	St. Matthew's Street	—	—	3	—	3
		2	3	38	48	91
Minimum required for improvements to road pattern in area south-east of East Road during the same period.	East Road (south)	—	2	—	—	2
	Bradmore Street	—	—	1	2	3
	South Street	—	1	4	1	6
	Broad Street	—	—	1	1	2
	Caroline Place	—	—	—	5	5
	Norfolk Street	—	5	5	1	11
	Flower Street	—	—	—	3	3
	Norfolk Terrace	—	—	3	—	3
	Blossom Street	—	—	6	—	6
	Staffordshire Street	—	1	9	4	14
	St. Matthew's Street	—	—	3	—	3
	Leader's Row	—	—	—	3	3
	Edward Street	—	2	—	—	2
	New Street	—	—	—	14	14
	Young Street	—	—	1	1	2
	Abbey Walk	—	—	2	—	2
	Sturton Street	—	4	2	—	6
	York Street	—	—	4	—	4
	York Terrace	—	2	2	—	4
		—	17	43	35	95
Minimum required for redevelopment of one area north-west of East Road during the same period.	East Road (north-west)	—	1	3	3	7
	Burleigh Street	—	1	3	—	4
		—	2	6	3	11
GRAND TOTAL Number of dwellings proposed for demolition and clearance 1951–62		21	59	156	235	471

TABLE 10

Land Approved and Recommended for Residential Development 1949-62

A. SITES APPROVED OR UNDER CONSIDERATION BY THE BOROUGH.

Estate or Site	Area in Acres	No. of Dwellings	Density of Population	
			Gross Site	Net Residential
Newmarket Road ..	57·0	308	17·5 persons per acre	27·0 persons per acre
Ditton Lane	48·0	320	21·8	30·0
Coleridge Road ..	38·0	310	21·5	40·0
Queen Edith's Way, North	75·5	460	19·5	32·5
Cherry Hinton ..	48·0	330	22·75	30·0
Arbury Road South	210·0	1,150	18·0	40·0
Total	476·5	2,878	—	—

B. ADDITIONAL SITES NOW RECOMMENDED FOR CONSIDERATION BY THE BOROUGH.

West Cambridge* ..	50·0	405	26·0	40·0
Queen Edith's Way, South	35·0	190	22·75	32·5
Histon Road ..	34·0	200	19·5	40·0
Cam Causeway ..	25·0	180	22·75	40·0
Hills Road (Red Cross)	32·5	200	19·5	32·5
Total	176·5	1,175	—	—

C. SITES RECOMMENDED FOR EARLY DEVELOPMENT BY PRIVATE ENTERPRISE.†

Queen Edith's Way, South	38	250	21·5	32·5
Trinity Farm (South of Barrow Road) ..	10	100	30·0	32·5
Histon Road ..	10	100	30·0	32·5
Hills Road (Red Cross)	5	50	30·0	32·5
Total	63	500	—	—

GRAND TOTAL—716 acres; 4,553 dwellings.

NOTES ON TABLE 10

* It may be preferable for this site to be developed by a Housing Association.

† No account has been taken in this Table of the numerous plots available for filling in existing lay-outs. This type of development is more suited to private enterprise than to Local Authority housing and should therefore be borne in mind when considering "C" above.

TABLE 11

Comparison of Population and Employment in and around Cambridge 1931 and 1948

	1931 Cambridge M.B. Linton and Chesterton R.D.s		1948 Estimates. Cambridge, Sawston and Cottenham Employment Exchanges	
		% of total population		% of total population
CIVILIAN POPULATION—all ages	103,236	—	128,000	—
CIVILIAN POPULATION—14 years and over ..	84,718	—	104,500	—
WORKING POPULATION (civilian only)	44,084	43	56,000	44
UNEMPLOYED	2,234	2	100	—
UNOCCUPIED AND RETIRED—14 years and over ..	38,400	37	48,400	38

NOTES ON TABLE 11

Source of Information.—Figures for the years compared come from two quite different sources of information and are, therefore, not strictly comparable. The 1931 figures are taken from the industrial tables of the Census, those for 1948 from the Ministry of Labour and are based on the issue of National Insurance Cards.

Areas to which statistics relate.—The 1948 figures relate to Employment Exchange Areas for which approximate limits only can be given. Cambridge, Cottenham and Sawston Exchanges cover rather more than Urban Cambridge: their total population is some 128,000, 81% of whom live in Urban Cambridge.

The industrial figures issued in 1931 relate to the local authority areas as they were then constituted, before the number of Rural Districts in Cambridgeshire was reduced from six to three. By amalgamating the figures for Cambridge M.B., Chesterton and Linton R.D.s, the nearest comparison possible with the 1948 figures has been made. Discrepancy between the areas to which the 1931 and 1948 figures relate is not great, amounting in 1948 to a population of about 3,000.

Composition of figures.—1931 figures are exact for each group. The figures for 1948 are estimates. 1948 total population and population of 14 years and over have been obtained from the 10% sample population survey previously described. The Ministry of Labour figures are issued merely as the number of insurance cards exchanged at the three Exchanges in July, 1948, and need adjustments for bulk exchange of cards (where a head office exchanges the cards of employees in scattered sub-offices). It is possible that some people may have failed to register for National Insurance and are therefore excluded. The figure of 1948 unoccupied and retired must be treated with especial caution as it is merely a residual figure left when working and unemployed are subtracted from the civilian population of 14 years and over. It therefore includes students to a greater extent than in 1931, and also 15-year-olds still at school as a result of raising of the school-leaving age in 1947.

TABLE 12

Analysis of Employment in and around Cambridge 1931 and 1948

Industrial Groups*	1931 Cambridge M.B., Linton and Chesterton R.D.s	1948 Cambridge, Cottenham and Sawston Exchanges. EMPLOYEES	% Change	1948 % of Total Employees	
				Cambridge Area	Britain
Agriculture, forestry, fishing	4,913	6,083	+ 24	11·4	4·7
Mining, quarrying, treatment of products, brickmaking ..	423	574	+ 35	1·1	5·8
Manufacture of chemicals, paints, glues, etc...	68	578	+750(1)	1·1	2·1
Engineering (not marine or electrical)..	241	411	+ 70(5)	0·8	5·0
Electrical installations, cables and apparatus : wireless ..	982	2,258	+130(4)	4·2	2·9
Construction and repair of vehicles	508	1,863	+267(2)	3·5	4·3
Other metal manufacture	254	275	+ 8	0·5	6·5
Manufacture of textiles	234	120	− 49	0·2	4·6
,, ,, leather	110	179	+ 63	0·3	0·4
,, ,, clothing..	1,245	521	− 58	1·0	3·1
,, ,, food, drink and tobacco	3,184	2,917	− 8	5·5	3·4
Woodworking	248	146	− 41	0·3	1·3
Papermaking and printing	1,425	1,517	+ 6	2·9	2·3
Scientific and surgical instruments	430	1,134	+163(3)	2·1	0·4
Other manufacturing industries	266	610	+129	1·0	1·5
Building and decorating	3,099	4,483	+ 35	8·4	6·4
Gas, water and electricity	461	741	+ 61	1·4	1·4
Transport and communications	2,756	3,034†	+ 10	5·7	8·7
Distributive trades, commerce and finance	7,049	6,587	− 7	12·3	12·5
Local Government	1,489	2,200†	+ 48	4·1	3·8
Central Government	855	3,847‡	+350	7·2	3·4
Professions	5,520	7,200	+ 30	13·5	5·7
Entertainments and sport	313	631	+102	1·2	1·1
Personal service	7,921	4,903	− 31	9·2	7·5
Other services	90	572	+535	1·1	1·2
TOTALS	44,084	53,384**	—	100	100

For general comments on sources of information and areas covered see notes to Table 11.

* Industrial groups—these vary slightly from the Standard Industrial Classification owing to the inflexibility of the Census data, which is given in great detail for the Borough but under broad headings only for the Rural Districts. In some cases it has therefore been necessary to arrange the more detailed 1948 figures in Census groups.

† Industries in which greatest adjustments to Ministry of Labour figures were necessary for bulk exchange of National Insurance cards.

‡ This figure was supplied by the Ministry of Town and Country Planning. Ministry of Labour statistics exclude permanent civil servants.

** This figure excludes 2,849 " self-employed," the majority of whom are connected with agriculture and the distributive trades. Percentage change in these two groups is therefore likely to be misleading.

TABLE 13

Employment Vacancies registered at Cambridge, Cottenham and Sawston Employment Exchanges at 8th June, 1949

1. Building	279
2. Miscellaneous Services (chiefly hotels, laundries and domestic service)	269
3. Distributive Trades	222
4. Engineering (including electrical and wireless)	156
5. Central and local Government	147
6. Construction and repair of vehicles and aircraft	138
7. Transport	101
8. Professions	98
9. Food Industries	96
10. Other Vacancies	276
TOTAL	1,782

Note.—Groups 1, 2, 3 and 7 contain most of the "service" trades. 4, 5 and 6 represent industries in which recent growth has been exceptional. 9 includes older food manufacturing industries.

TABLE 14

1948 and Proposed Future Neighbourhood Populations and Gross Densities

Sector		Population				Developed Area †	Gross Neighbourhood Density. Persons per acre
		Family	Institutions	All Students*	Total		
1	1948	710	—	184	894	36	25
	Proposed	710	—	404	1,114	36	31
2	1948	970	230	2,615	3,815	182	21
	Proposed	970	—	3,225	4,195	182	23
3	1948	4,510	—	1,597	6,107	240	25
	Proposed	3,900	—	1,907	5,807	240	24
4	1948	13,760	80	496	14,336	497	29
	Proposed	6,760	80	246	7,086	497	14
5	1948	5,660	48	401	6,109	239	26
	Proposed	5,660	48	301	6,009	239	25
6	1948	7,960	—	134	8,094	479	16
	Proposed	11,750	—	67	11,817	700	17
7	1948	9,920	110	243	10,273	553	19
	Proposed	10,500	110	121	10,731	553	19
8	1948	2,480	—	8	2,488	167	15
	Proposed	5,200	—	8	5,208	437	12
9	1948	9,080	30	28	9,138	345	26
	Proposed	9,100	30	8	9,138	345	26
10	1948	10,710	275	456	11,441	965	12
	Proposed	15,425	275	386	16,086	1,226	13
11	1948	1,120	—	156	1,276	166	8
	Proposed	1,120	—	100	1,220	166	7
12	1948	2,270	—	655	2,925	557	5
	Proposed	3,660	—	1,131	4,791	594	8
13	1948	3,220	—	200	3,420	377	9
	Proposed	4,182	—	600	4,782	430	11
14A	1948	1,190	475	48	1,713	414	4
	Proposed	1,490	705	48	2,243	616	4
14B	1948	2,600	—	11	2,611	207	13
	Proposed	2,630	—	11	2,641	235	11
15	1948	1,690	—	6	1,696	—	Village Structure ‡
	Proposed	3,070	—	6	3,076	223	14‡
Borough	1948	77,850	1,248	7,238	86,336	5,424	16‡
	Proposed	86,127	1,248	8,569	95,944	6,719	14

* All students—University and other college students.
† Developed area—excluding agricultural and railway land, but including all open spaces and allotments.
‡ The present developed area and gross neighbourhood density of Cherry Hinton village have not been calculated as the village is still rural in character. Both its population and its developed acreage have been excluded in the calculation of the 1948 gross neighbourhood density of the whole Borough.
Sectors in this Table are those shown on Map 32.

TABLE 15

Floor Space in the Central Area of Cambridge

PART 1 : SUMMARY OF USES—AREAS 1A AND 1B

		Uses	Floorspace sq. ft.	% of Total Floorspace
AB	1	Colleges, College hostels and University lodging-houses	2,977,584*	32
	2	Non-university dwellings and residential	1,460,516	16
	3	Residential hotels	214,790	2
C		Schools	20,735	—
D	1	Shops†	1,186,573	13
	3	Public houses	57,653	1
E		Offices	383,643	4
FG		Storage	208,564	2
H	1	University administration, teaching and assembly..	1,523,339	16
	2	Local and central government and public utility offices	333,095	4
	3	Public assembly	436,227	5
	4	Churches	136,042	1
JKL		Industry	327,172	3
M		Other Uses	22,735	—
		Vacant	41,565	1
FLOORSPACE OF CENTRAL AREA—1A AND 1B			9,330,233	100

* This figure includes 392,422 sq. ft. of University lodging-houses.

† There is 9,816 feet run of shop frontage.

PART 2 : SUMMARY OF USES—AREA 2A

		Uses	Floorspace sq. ft.	% of Total Floorspace
AB	1	Colleges, College hostels and University lodging-houses	—	—
	2	Non-university dwellings and residential	49,222	16
	3	Residential hotels	—	—
C		Schools	—	—
D	1	Shops*	238,151	79
	3	Public houses	3,468	1
E		Offices	—	—
FG		Storage	6,121	2
H	1	University administration, teaching and assembly ..	—	—
	2	Local and central government and public utility offices	—	—
	3	Public assembly	—	—
	4	Churches	—	—
JKL		Industry	5,420	1
M		Other uses	—	—
		Vacant	1,347	1
FLOORSPACE OF AREA 2A			303,729	100

* There is 1,333 feet run of shop frontage.

TABLE 16

Density of Building Accommodation—Areas 1A and 1B

(AREAS IN SQ. FT.)

Street Block	Floor Area within Street Block			Gross site area of Street Block including half width of street	Floor Space Index
	Ground Floor	Other Floors	Total		
1	32,137	87,278	119,415	50,760	2·36
2	79,334	160,182	239,516	142,900	1·68
3U	25,743	80,478	106,221	56,628	1·88
3E	95,982	217,399	313,381	124,472	2·52
4	75,800	117,600	193,400	115,300	1·67
5	106,352	230,712	337,064	188,800	1·78
6	65,982	152,467	218,449	97,210	2·23
7NE	95,600	193,556	289,156	168,666	1·71
7SW	139,498	167,786	307,284	261,370	1·18
7 Total	235,098	361,342	596,440	430,036	1·39
8N	32,264	38,301	70,565	45,956	1·54
8U	141,156	326,937	468,093	222,156	2·12
9	45,563	63,501	109,064	155,204	0·70
10	17,900	33,028	50,928	30,710	1·66
11S	57,255	69,798	127,053	177,812	0·71
11C	48,309	81,560	129,869	257,875	0·50
12NE	98,177	107,687	205,864	147,400	1·395
12SE	42,708	77,804	120,512	85,290	1·41
12S	28,799	38,717	67,516	147,639	0·46
12C	56,668	55,725	112,393	783,644	0·14
12U	154,411	384,702	539,113	395,960	1·36
13	107,929	204,308	312,237	342,033	0·92
14	59,934	105,830	165,764	205,167	0·81
14C	63,860	85,319	149,179	355,014	0·42
15N	42,602	63,163	105,765	85,610	1·24
15C	22,367	41,972	64,339	58,806	1·09
16N	28,217	57,055	85,272	50,326	1·69
16S	54,136	82,893	137,029	130,900	1·05
17N	74,161	92,942	167,103	160,122	1·04
17C	55,416	93,284	148,700	304,449	0·49
17 Total	129,577	186,226	315,803	464,571	0·68
18	14,729	28,386	43,115	39,950	1·08
19	36,909	49,585	86,494	108,600	0·79
20	61,790	95,945	157,735	173,800	0·91
21E	9,412	31,500	40,912	34,060	1·20
21S	14,240	42,660	56,900	19,150	2·97
21C	28,185	38,773	66,958	230,868	0·29
21 Total	51,837	112,933	164,770	284,075	0·58
22	76,090	138,212	214,302	103,000	2·08
23	19,150	23,123	42,273	56,284	0·75
24	97,280	106,548	203,828	206,953	0·98
25	45,774	49,570	95,344	72,188	1·32
26	27,593	27,028	54,621	63,453	0·86
27	19,755	28,241	47,996	45,988	1·04
28W	48,919	51,219	100,138	124,189	0·81
28C	88,655	136,990	225,645	1,376,322	0·16
29	36,948	21,222	58,206	58,809	0·98
30N	10,301	13,837	24,138	18,953	1·27
30SE	18,580	43,893	62,473	26,391	2·36
30C	186,496	321,664	508,160	727,450	0·70
31	35,632	80,149	115,781	103,237	1·12
32U & C	211,191	362,155	573,346	868,586	0·67
33	13,199	26,113	39,312	18,077	2·2
33C	42,776	83,157	125,933	123,710	1·02
34	57,124	126,093	183,217	104,456	1·75
35	78,453	95,740	174,193	135,860	1·29

(Continued

TABLE 16 (*continued*)

Street Block	Floor Area within Street Block			Gross site area of Street Block including half width of street	Floor Space Index
	Ground Floor	Other Floors	Total		
36N	106,245	145,342	251,587	586,318	0·43
36W	14,651	16,745	31,396	50,744	0·62
36S	95,511	75,420	170,931	237,838	0·72
36 Total	216,407	237,507	453,914	874,900	0·52
37	69,139	45,819	114,958	332,319	0·35

Density of Building Accommodation Areas 2A and 2B

(AREAS IN SQ. FT.)

908	23,843	12,214	36,057	85,585	0·421
909	46,305	35,212	81,517	96,833	0·841
910N	21,476	20,272	41,748	78,974	0·532
910S	62,874	76,668	139,542	107,418	1·299
911	13,488	23,496	36,944	38,341	0·963
912	7,386	6,815	14,201	21,531	0·66
913	15,406	15,091	30,497	28,488	1·07
924N	6,887	3,662	10,549	15,399	0·73
924S	6,692	6,953	13,645	20,901	0·619
925N	3,755	6,058	9,813	8,239	1·19
925S	4,611	3,137	7,748	15,069	0·514
926N	11,155	14,997	26,152	22,402	1·273
926S	14,219	13,976	28,195	33,398	0·772
937N	28,819	58,357	87,176	104,108	1·188
937S	26,324	10,254	36,578		
938	25,276	20,428	45,704	50,965	0·898
939	45,377	32,257	77,634	88,426	0·877
940	39,141	30,480	69,621	78,495	0·888
941	73,575	58,993	32,568	141,787	0·935
942	24,195	9,327	33,522	54,145	0·619

NOTE.—The reference numbers in the first column of this table relate to Map 42.

APPENDIX

ROAD TRAFFIC IN CAMBRIDGE

A report to the County Planning Committee of the County Council by the County Planning Officer and the planning consultant

THE following report summarises the results of studies of road and street traffic in and near Cambridge during the year ended February 1st, 1949. The County Planning Department, working with the planning consultant, is responsible for all the conclusions in the report and also carried out many of the studies. For other information—including some of the most important—the Department is indebted to the Ministry of Transport, the County Surveyor, the Borough Engineer and Surveyor, and the Chief Constables of the County and Borough. All of these provided advice and information and in some cases carried out special studies at the Department's request. The help of many firms and individuals in providing information is also gratefully acknowledged.

CAMBRIDGE AND LONG-DISTANCE TRAFFIC

1 Cambridge is halfway between London and The Wash and the London to King's Lynn road runs through it. For traffic from the Midlands it stands at the centre of the East Anglian boundary and is a main gateway to East Anglia.

Trunk Roads

2 The layout of Trunk and First Class Roads near Cambridge is shown on Map 44. Four north–south Trunk Roads come into the town or pass near it. A10 (London–King's Lynn) runs through the town; A1 (Great North Road) is 18 miles away to the west; and A14, a diagonal link between A1 and A10, is 10 miles away, also on the west. A11 (London–Norwich) is about 10 miles away to the east. In an east–west direction there is only one Trunk Road, A45 (Birmingham–Ipswich), and this runs through the town. The chief First Class Roads are A130, which brings Chelmsford and London traffic (along A11) into A10 just south of Cambridge, and that portion of A604 which lies north and west of Cambridge. A604 is a notable road for Cambridge people as it forms the backbone of the town, entering, from Haverhill, as Hills Road at one end of the town and emerging at the other end, after half a dozen changes of name, as Huntingdon Road. In this report it will frequently be referred to as "the spine."

3 The map suggests that long-distance traffic passing through Cambridge is likely to be that travelling along the lines of A10, A45, A604 (northern portion) and A130. The figures for through traffic in Table C (and Map 46) go some way to confirm this.

4 Table A below shows the volumes of motor traffic near the County boundary in 1938 and 1948 on the roads mentioned above. Figures from the Census for Saturday, 20th August, 1938, are given in columns (2) and (3); those in column (4) were based on half-hour counts between 10 a.m. and 3 p.m. on Saturday, September 18th, 1948. The figures in Table A give a rough indication of the relative wear and tear to which the roads are exposed, and suggest that the average daytime volume of motor traffic on the busiest road approaching Cambridge is probably about one-quarter of that carried by any of the busiest streets in the centre of the town during the peak hours for local traffic (see Table F). Table A does not give any information on the amount of through traffic approaching the town—that is, traffic that does not intend to stop in Cambridge but will pass through some part of the built-up area.

APPENDIX—TABLE A

	Aug. 1938		Sept. 1948
	Total for 16 hours	Average v.p.h.	Average v.p.h.
(1)	(2)	(3)	(4)
A10 (North of Royston) ..	1,839	115	102
A14 (Long Stowe)	1,320	83	89
A45 (Caxton Gibbet)	1,692	106	129
A604 (South of Godmanchester)	2,635	133	136
A130 (South of Whittlesford Cross-Roads)	1,507	94	82
A1 (Near Sandy)	3,352*	209*	—
A11 (South of Newmarket) ..	4,562*	285*	—

* Figures are averages for a week and not those for Saturday.

THROUGH TRAFFIC

5 Through traffic is of importance to the planning of any town and especially to that of Cambridge. All that is reasonable should be done to enable through traffic to pass round rather than across the town; and the sums that it is reasonable to spend on bypass or ring routes—at about £50,000–£75,000 a mile—must be proportioned

APPENDIX—TABLE B

Summary of Analysis of O. and D. Census

	A604		B1049		A10		A45				A604		A130		A10		A603		A45			
	Hunting-don		Histon		Milton		New-market		Cherry Hinton		Hills		Shelford		Royston		Barton		Mading-ley		Totals	
	Thro'	Term'	Thro'	Term'	Thro'	Term'	Thro'	Term'	Thro'	Term'	Thro'	Term'	Thro'	Term'	Thro'	Term'	Thro'	Term'	Thro'	Term'	Thro'	Term'
Friday, 22nd October Totals	365	1114	65	455	194	612	303	865	28	276	106	475	253	693	216	685	46	465	212	426	1,788 + 6,066 = 7,854	
%s	24·6	75·4	12·5	87·5	24·2	75·8	25·9	74·1	9·2	90·8	18·3	81·7	26·8	73·2	23·9	76·1	9·0	91·0	33·2	66·8	22·8%	77·2%
Saturday, 23rd October Totals	264	1139	78	551	136	577	236	722	27	276	100	489	152	729	150	725	53	457	133	439	1,329 + 6,104 = 7,433	
%s	18·7	81·3	12·4	87·6	19·1	80·9	24·7	75·3	8·9	91·1	16·9	83·1	17·3	82·7	17·1	82·9	10·4	89·6	23·3	76·7	17·9%	82·1%

APPENDIX—TABLE C

Summary of Through Traffic. Friday, 22nd October, 1948

DESTINATIONS

ORIGINS	Hunting-don Rd.		Histon Rd.		Milton Rd.		New-market Rd.		Cherry Hinton Rd.		Hills Rd.		Shelford Rd.		Royston Rd.		Barton Rd.		Mading-ley Rd.		
	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%	Totals
Huntingdon Rd. ..	—	—	22	6	22	6	117	32	8	2	47	13	78	21	63	17	5	1	3	1	365
Histon Rd. ..	7	11	—	—	1	1	9	14	3	5	4	6	13	20	22	34	5	8	1	1	65
Milton Rd. ..	8	4	1	—	—	—	11	6	3	2	9	5	33	17	109	56	6	3	14	7	194
Newmarket Rd. ..	113	37	16	5	19	6	—	—	—	—	—	—	4	1	34	11	18	6	99	33	303
Cherry Hinton Rd.	9	32	—	—	3	11	—	—	—	—	—	—	3	11	4	14	4	14	5	18	28
Hills Rd.	58	55	7	7	22	21	1	1	—	—	—	—	—	—	3	3	2	2	13	12	106
Shelford Rd. ..	119	47	12	5	74	29	9	4	2	1	1	—	—	—	11	4	12	5	13	5	253
Royston Rd. ..	19	9	28	13	87	40	33	15	5	2	3	1	11	5	1	—	26	12	3	1	216
Barton Rd. ..	5	11	10	22	10	22	10	22	5	11	1	2	1	2	4	9	—	—	—	—	46
Madingley Rd. ..	4	2	7	3	25	12	111	52	4	2	22	10	17	8	22	10	—	—	—	—	212
Totals ..	342	—	103	—	263	—	301	—	30	—	87	—	160	—	273	—	78	—	151	—	1,788

N.B.—The Table for the Friday is given because this represents normal weekday through traffic, which is greater than that at weekends

to the volume of existing and probable future through traffic. With the primary aim of finding out the approximate amount and proportion of through traffic under present conditions, an Origin and Destination Census* was taken on main road approaches to Cambridge on Friday and Saturday, October 22nd–23rd, 1948. The census was of inward-bound motor traffic at points on or near the Borough boundary (see Map 45). The main results are summarised in Tables B and C.

6 Table B shows that the traffic approaching Cambridge (from beyond the Borough boundary) at present contains from 9 to 33 per cent. of through traffic—the average being about 20 per cent. The hours during which the bulk of through traffic approaches the town may be significant, since if this occurred during peak hours for local traffic it might make all the difference between tolerably good conditions and congestion. It has been found that on the first day of the census, Friday, 28 per cent. of through traffic approached the town during peak hours. Put another way this means that of *all* traffic approaching the town from beyond the Borough boundary, 5 or 6 per cent. is through traffic which enters the town during peak hours for local traffic.

7 The area in which serious traffic congestion takes place in Cambridge is small compared with the total built-up area. The congested area is shown by a stipple on Map 46, as well as on other maps, and extends from Magdalene to about the University Arms Hotel, and from Silver St. to Drummer St. and King St. Through traffic which enters this area of narrow, crowded streets is specially unwanted. In order to see what approximate proportion of through traffic enters the central area, all through vehicles that approached Cambridge during two one-hour periods on the first day of the census (Friday) were labelled and traced through the town.

8 The results of these two samples are given on Map 46. From a study of this map it is plain that most through vehicles did not enter the centre at all. Nearly 90 per cent. of them circled round, making use of the existing roads which form something of a ring around the centre. General observations support the results of these two tests, and there seems no reason to suppose that through traffic generally does not behave in very much the same way as the 264 through vehicles whose routes were traced. This assumption can be checked without great labour by other sample censuses, using registration numbers to avoid stopping vehicles. If it is correct, it suggests that of the 8,000 vehicles that cross the Borough boundary towards Cambridge on main roads on a normal weekday only about 4 per cent. are through vehicles that go by way of the congested central streets.

9 The preceding figures imply that through traffic at present contributes little to congestion in the central area. On the other hand, about 18 per cent. of vehicles approaching the town from outside the Borough boundary are through vehicles that come in as far as Chesterton Road, the Backs, etc., before beginning to circle round the inner portion of the town. Quite a large proportion of these are heavy vehicles and they form a noticeable part of traffic in suburban areas (see Map 46). It will also be seen that Queen's Road (the Backs) is a major link in the "inner ring." It carries about two-fifths of all through traffic which circles around the central area, including most of the through traffic on A10 and A130 (Royston Road to Milton Road), which takes the longer and freer route round the Backs rather than the shorter and more congested way *via* Lensfield Road, Park Side and Victoria Avenue. On the basis of the sample, the total volume of through traffic on the Backs is small —500 or 600 vehicles in 11 hours.† If this volume were evenly distributed over 11 hours one vehicle would be almost out of sight before the next appeared.

10 The comparative volumes of through and terminating traffic, and the entry and exit points of through traffic, are shown diagrammatically on Map 47. Most of the traffic is terminating and through traffic is fairly evenly distributed among six out of the ten roads. It will be noticed that the "up" and "down" through traffic along a route does not always balance. The predominance of Huntingdon Road as a traffic route is to some extent fictitious. The census was taken at the Borough boundary and the boundary on the Huntingdon Road is on the town side of what may be called for this purpose a portion of suburban Cambridge. On other roads the boundary is outside the suburbs. Thus the Huntingdon Road figures are swelled by some purely suburban traffic.

TERMINATING TRAFFIC

11 The census obtained the destinations of all terminating traffic—i.e. traffic that crossed the Borough boundary on main roads to some destination within the Borough.

12 The destinations of terminating traffic were first classified according to whether they were in the central area or east or west of the spine (Huntingdon Road to Hills Road). The results are shown in detail in Table D and may be summarised as follows: —

PERCENTAGES OF TERMINATING TRAFFIC WITH DESTINATIONS IN CERTAIN DISTRICTS

	Central Area	East of the Spine	West of the Spine	Undetermined
Friday ..	36	41	16	7
Saturday ..	47	36	14	3

* The Census was approved by the Ministry of Transport and carried out by the County Surveyor.

† There is some evidence that traffic on the Backs road has increased since the date of the Census.

APPENDIX —TABLE D

PROPORTIONS OF TERMINATING TRAFFIC BOUND FOR THE CENTRAL AREA AND EAST AND WEST OF THE SPINE

Friday, 22nd October

Road of Origin	Central Area		East of Spine		West of Spine		Undetermined	
	Nos.	%	Nos.	%	Nos.	%	Nos.	%
Huntingdon ..	366	33	397	36	177	16	174	16
Histon ..	208	46	184	41	56	12	4	1
Milton ..	197	32	324	53	85	14	6	1
Newmarket ..	236	27	416	48	122	14	91	11
Cherry Hinton	88	32	122	44	45	16	21	8
Hills	183	38	178	38	92	19	22	5
Shelford ..	269	39	217	31	152	22	55	8
Royston ..	322	47	251	37	94	14	18	2
Barton ..	174	37	202	44	61	13	28	6
Madingley ..	147	34	186	44	73	17	20	5
Totals ..	2,190	36	2,480	41	957	16	439	7

Saturday, 23rd October

Huntingdon ..	594	52	355	31	168	15	22	2
Histon ..	274	50	234	42	41	7	2	1
Milton ..	257	45	256	44	61	10	3	–
Newmarket ..	237	33	360	50	95	13	30	4
Cherry Hinton	112	41	116	42	37	13	11	4
Hills	230	47	144	29	107	22	8	2
Shelford ..	389	53	159	22	137	19	44	6
Royston ..	347	48	258	36	109	15	11	1
Barton ..	260	57	132	29	36	8	29	6
Madingley ..	193	44	167	38	73	17	6	1
Totals ..	2,893	47	2,181	36	864	14	166	3

13 This distribution is what one would expect. The central area attracts far more traffic in proportion to its size than any other district, but on a normal weekday east Cambridge—containing four-fifths of the dwellings and factories—attracts a larger total of traffic. On Saturday, when many country people shop in Cambridge, the central area is the destination of nearly half of all traffic. The west side of the spine (outside the central area) attracts little traffic into the Borough.

14 Terminating traffic has also been analysed to show the average number of vehicles per hour that approach each of 17 subdivisions of the Borough from each of the main entering roads. These figures are available in table and chart form in the County Planning Department and are likely to prove useful in estimating the value of particular road improvements. Terminating traffic was also analysed by origin. On both days about 70 per cent. of the traffic came from places within the County.

15 The results of both the through and terminating traffic portions of the census suggest that it is on the east side of Cambridge that road improvements would be of most benefit, especially those which would serve both east Cambridge and the central area.

1938 AND 1948 TRAFFIC

16 The census of October, 1948, was taken at or very near points used by the Ministry of Transport before the war in its triennial traffic censuses, of which the last was taken in August, 1938. An attempt has therefore been made to compare 1938 and 1948 traffic volumes. For a number of reasons only a very approximate comparison can be made. The Ministry of Transport Census was taken in August, whereas in Cambridge it is desirable that a traffic census should be taken in Full Term if it is hoped to catch peak volumes. Arrangements could not be completed before the end of the May Term and this delayed the census until October. An origin and destination census—the main object at Cambridge—is impracticable in hours of darkness, and thus the Cambridge census was taken for 11 hours each day instead of the Ministry of Transport's 16. For these and other reasons it was impossible to produce fully comparable results from the two censuses. A very approximate comparison is made in Table E.

17 If Table E is accepted as being a roughly accurate comparison—admittedly a large assumption—it would appear that weekday business traffic in Cambridge is now greater than before the war, especially when allowance has been made for a considerable holiday element in the 1938 Friday traffic. The large difference between the Friday and Saturday totals in 1938 is no doubt mainly attributable to local pleasure-motoring on the Saturday. In 1948 the Saturday total, as one would expect, drops below that of Friday. There is therefore some basis for a belief that an abolition of petrol restrictions would immediately raise Saturday traffic to Cambridge to a level well above that of 1938.

APPENDIX—TABLE E

Comparison of Volumes of Traffic Entering Cambridge on Weekdays, 1938–48

Entrance Roads	Friday, 19th August, 1938		Friday, 22nd October, 1948
	Two-way Volumes over 16 hours	Entering only over 11 hours*	Entering only over 11 hours
Huntingdon Rd. ..	3,783	1,285	1,479
Histon Rd. ..	1,652	568	520
Milton Rd. ..	1,959	674	806
Newmarket Rd. ..	2,496	858	1,168
Hills Rd.	1,231	423	581
Shelford Rd. ..	2,882	991	946
Royston Rd. ..	2,153	740	901
Barton Rd. ..	895	308	511
Madingley Rd. ..	1,370	471	638
	Saturday, 20th August, 1938		Saturday, 23rd October, 1948
Huntingdon Rd. ..	4,828	1,660	1,403
Histon Rd. ..	1,625	559	629
Milton Rd. ..	2,323	799	713
Newmarket Rd. ..	3,835	1,318	958
Hills Rd.	1,617	556	589
Shelford Rd. ..	2,972	1,022	881
Royston Rd. ..	2,500	860	875
Barton Rd. ..	1,153	396	510
Madingley Rd. ..	2,332	802	572

* These figures were arrived at by applying the factor $\frac{11}{22}$, that is by dividing by 2 to get a unidirectional volume, and by $\frac{11}{12}$ to rectify the differing periods of the counts.

LOCAL TRAFFIC

Traffic volumes at peak hours

18 It has been mentioned that the census in October, 1948, was taken at the Borough boundary, that is, at points 1½ to 3 miles from the centre of the town. About 8,000 motor vehicles entered the Borough by main roads on each day of the census, and presumably an equal number went out. No origin and destination census has been taken of local traffic—traffic of all kinds moving within the Borough—but a great deal of other information has been compiled which enables the volume and direction of local traffic flows and the obstructions they meet to be seen fairly clearly. It should be stated, and indeed stressed, that local traffic includes pedal cycles as well as motor vehicles. Pedal cycles are a major element in Cambridge local traffic, and both cycles and cycle traffic possess features peculiar to themselves.

19 Map 48 was prepared as a base map for the study of local traffic problems. It shows by parallel black lines the number of 9-foot-wide traffic lanes along main traffic routes in Cambridge. A road with a carriageway 18 feet in width is shown on this map by two black lines, one 27 feet in width by three lines, and so on. Only multiples of 9 feet are used, because carriageways that are not multiples of a traffic lane are specially liable to stoppages and congestion in streets that carry heavy traffic. A street 23 feet wide is therefore shown on Map 48 as having a two-lane carriageway. Lanes 9 feet wide, instead of the normal 10 feet, have been used for the map as they approximate much closely to existing and probable future conditions. The narrower lane is also a concession to the skill Cambridge drivers should possess in driving in narrow streets alongside an unusually large proportion of pedal cycles.

20 It is a commonplace of road traffic studies that streets are narrowest in the centres of towns where traffic needs require them to be extra wide. Examination of Map 48 shows how narrow are the channels through which traffic has to pass in the centre of Cambridge. Magdalene St., Sidney St., Trinity St., Silver St. and Downing St. are all less than two lanes wide for a portion of their lengths. Outside the central area—for example, on the "inner ring" of the Backs road, Chesterton Road, Victoria Avenue, etc.—roads are generally two, three or even four lanes wide and no serious congestion occurs on them, although in some cases they carry traffic volumes similar to those in central streets. Judging from this map alone the causes of traffic congestion in the centre seem to be the common ones—heavy traffic, narrow streets and awkward corners.

21 It is preferable to make traffic counts at daily peak hours so as to see the worst conditions that normally occur on roads. In Cambridge there are the usual peak periods for traffic—morning, midday and evening—and as a great many people in Cambridge return home for their midday meal the highest volumes on most streets occur at lunch time.

22 During May and early June, 1948, traffic volumes on some of the main streets were measured by automatic counter from 8 a.m. to 6 p.m., readings being taken every quarter hour. The greatest volumes on each road in any one hour are given in Table F. These volumes are also shown diagrammatically on Map 49,* which also gives the day of count for each road.

* For these counts we are indebted to the Chief Constable of the Borough.

APPENDIX—TABLE F

	Street	Width in 9-ft. lanes		Time of Day	Greatest Traffic Volume in 1 hour*	
		Narrowest	General		Motor Vehs.	Cycles
Central Area	Magdalene St.† ..	1	1½	12.45– 1.15 p.m.	396	1,475
	St. Andrew's St. ..	2	2	12.15– 1.15 p.m.	508	1,989
	Sidney St.	1	2	4.45– 5.45 p.m.	341	1,663
	Trinity St.	1	2	12.15– 1.15 p.m.	257	1,022
	King's Parade ..	2	2	11.15–12.15 p.m.	415	1,341
	Downing St.	1	2	12.15– 1.15 p.m.	255	959
	Regent St.	2	3	12.00– 1.00 p.m.	571	1,121
"Inner Ring"	Chesterton Rd. ..	2	4	12.30–1.30 p.m.	332	607
	Victoria Ave.	2	4	12.30–1.30 p.m.	667	1,369
	Emmanuel Rd. ..	2	2	5.00–6.00 p.m.	452	792
	Park Side	3	4	1.30–2.30 p.m.	341	1,044
	Lensfield Rd.	2	3	12.15–1.15 p.m.	390	574
	Queen's Rd.	3	3	5.00–6.00 p.m.	358	359
	Newmarket Rd. ..	3	4	12.30–1.30 p.m.	526	877

* The figures given refer to conditions before the introduction of the one-way system in the centre.

† Magdalene Street was not included in the 10-hour automatic counts. The figures given are vehicles per hour based on a half-hour count and therefore are not exactly comparable with the other figures.

APPENDIX—TABLE G

CAR AND CYCLE PARKING IN THE CENTRE: JANUARY, 1949

Area covered: within radius of 660 yards from Christ's College Gateway. Weather: fine throughout.

Date	Time	Unauthorised			Authorised						Cycles	Commercial Garages, etc.*
		Roadside Parking			Unilaterals			Car-parks		Taxi Ranks		
		Parked	Attended or loading	Total	Parked	Attended or loading	Total	Period limit 2 hrs.	Period unlimited			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Friday, 14th Jan.	11.0–12.0 noon	328	72	400	66	11	77	29	202	24	1,177	179
	2.30–3.30 p.m.	318	61	379	62	8	70	27	212	17	1,684	
Saturday, 23rd Jan.	11.0–12.0 noon	472	55	527	70	16	86	28	194	21	2,534	
	3.0–4.0 p.m.	484	57	484	52	17	69	34	462	16	1,730	357
Capacities							196	43	Monday-Friday 445 Saturday 380†			Monday-Saturday morning 277 Saturday 367

* Figures for commercial garages exclude hotel garages catering almost exclusively for patrons, e.g. Lion New Private Yard and Blue Boar.

† Thus on Saturday, 23rd January, 1949, authorised car parks without time restriction contained 82 more cars than their official capacity.

23 The Ministry of Transport's Departmental Committee were not precise (paragraphs 58–59 of *Roads in Built-up Areas*) on what should be taken as the capacity of a traffic lane under conditions like those in the central area of Cambridge. 400 vehicles per hour appears to be the best figure to take, and certainly not more than 500 vehicles as a maximum. The admissible capacity of Magdalene St., Trinity St. and Sidney St., as unobstructed two-way streets, would therefore appear to be 500–700 motor vehicles per hour. Before the introduction of the one-way system Sidney St. was carrying about 340 motor vehicles and 1,600 cycles in the peak hour, and Magdalene St. (with a carriageway only 15 feet 7 inches wide at one point), still continues to reach a flow of 400 motor vehicles and 1,500 cycles per hour. There is no satisfactory way of equating motor and cycle traffic, but a rough-and-ready way of doing so is to reckon that two cycles equal one motor vehicle. By this or any other method of computation these streets must be said to be heavily overloaded.

24 The main streets which are at least two lanes wide throughout, St. Andrew's St. and King's Parade, are better off, with peak-hour loads of 250/1,000 and 200/650 vehicles per traffic lane respectively; and if these streets were freed from obstruction by standing vehicles they might not be much overloaded. The one-way system has lessened congestion on Sidney St. and Trinity St., but counts taken after the introduction of this system show that they still carry 260/460 in the former case and 320/440 in the latter, and these last figures are from out-of-Term counts.

25 Comparison of Cambridge traffic with that of other towns is difficult unless these also have a large amount of cycle traffic. Oxford, a town somewhat similar in kind and population, naturally invites comparison, as its heavy traffic was the subject of special comment in Dr. Sharp's report.* According to that report traffic volumes at two points in the centre in 1946 were as set out below:—

Street	Width in 9-ft. traffic lanes		Time of Day	Highest volume in one hour	
	Narrowest	General		Motor Vehs.	Cycles
High St. ..	3 (31 ft.)	5 (44 ft.)	8–9 a.m.	779	1,934
			2–3 p.m.	1,029	1,105
Cornmarket St.	2 (25 ft.)	3 (32 ft.)	8–9 a.m.	537	701
			2–3 p.m.	720	779

These figures imply that cycle traffic in the centre of Oxford is much the same as in Cambridge. Motor traffic in central Oxford in 1946 was appreciably heavier than in Cambridge in 1948. In terms of *number of vehicles per traffic lane,* however, Oxford is or was better off than Cambridge, and it is on this ratio that the presence or absence of congestion largely depends.

26 Congestion is rare on the roads that form the Cambridge "inner ring." The peak-hour volumes per traffic lane on these roads (see Table F) range from 350/650 down to 120/120 at their narrowest points, and their freedom from congestion is partly due to these smaller volumes (especially of cycle traffic) and partly—and perhaps largely—to their freedom from obstruction by standing vehicles and vehicles pulling in and out. Where congestion does occur on these roads it can be readily explained. For example, the Four Lamps roundabout at the junction of Victoria Avenue and Maids Causeway is too small, and Victoria Bridge-head is narrow, awkwardly aligned and obstructed by shopping traffic. It will also be seen from Table F that the "inner ring" is heavily loaded on its eastern portions and less so on the west.

TRAFFIC FLOWS

27 A large number of counts have been made to determine the volume and direction of traffic flows near the centre, including counts of turning traffic at all main junctions. It was found that the peak period for traffic over most of the roads in this area was between 12.45 and 1.15 p.m. and Maps 50 and 51 were prepared to give a picture of the general distribution of cycle and motor-vehicle traffic at this time of day. Most of the counts were made out-of-Term, but the street intersections most affected by University cycle traffic at lunch time were re-examined in Full Term and the results are shown inset on Map 50. In-Term and out-of-Term conditions at these two intersections may therefore be compared.

28 The various counts show that the main flows of traffic (cars and cycles combined) are up and down the spine and along and between the radiating roads to the east. There is relatively little cycle traffic west of the spine (except in the central area itself). An appreciable amount of motor traffic uses Trumpington Road and Trumpington St.—some, perhaps much, of it being attributable to the introduction of the one-way system in Trinity St. Otherwise motor traffic is mainly along the spine and roads east of it. Map 50 shows that at every crossing the major stream of cycles is away from the centre and gives some idea of the proportions of central area workers who live in the various districts of the town.

29 Victoria Avenue, the only cross-river route east of the spine, carries a great deal of traffic. This is partly composed of motor traffic bypassing the centre (see Map 46), and partly of workers in the central area moving to and from houses in the north-eastern suburbs. Map 50 shows the heavy cycle traffic going home to a midday meal and the general traffic between the north and south portions of east Cambridge. It has been mentioned earlier that four-fifths of the population of Cambridge live east of the spine and four-fifths of the factories are located

* *Oxford Replanned,* by Thomas Sharp. Architectural Press, 1948. For street widths we are indebted to the City Engineer, Oxford.

there. It therefore seems plain that the lack of additional river crossings on the east forces a good deal of traffic to come nearer the spine and the centre than it would do if these crossings were available.

30 Maps 50 and 51 also emphasise the concentration of traffic at the St. Andrew's St.–Emmanuel St. crossing. As the Jesus Lane entry from the east involves a northward turn around St. John's corner, and as Hobson St. is one-way, nearly all traffic into the centre from the north (*via* Victoria Avenue) from the east, south-east and south has to pass this corner. Improved access to the central area from the east and south-east is much needed.

31 Traffic approaching the central area from the south and south-east has three well-spaced direct routes to choose from: Trumpington Road, Hills Road and Mill Road. Motor traffic in the lunch-time peak period uses these roads in the respective proportions 1.2–2.2–1.0 and cycle traffic in the proportions 1.0–2.5–4.0. Traffic approaching the other end of the central area, from Huntingdon Road and Histon Road, has only one direct route —the spine itself. A proportion of the motor traffic may go round by Silver St. or Victoria Avenue, but a good deal of it and probably all the cyclists take the direct route across Magdalene Bridge. As has been mentioned, the carriageway in Magdalene St. is only 15 feet 7 inches wide, less than two lanes, at its narrowest, and carries about 400 motor vehicles and 1,500 cyclists in the peak hour. It must therefore be regarded as quite inadequate for the traffic it has to bear.

PARKING AND WAITING

32 The figures given previously, notably in Table F, and a comparison of Maps 48 and 49, make it clear that the main streets in the centre would be overloaded at peak hours even if they were free from obstruction by standing vehicles and pedestrians. The most casual inspection shows that there is obstruction from both these causes and especially from standing vehicles. Some obstruction by standing vehicles is unavoidable in the centre of every older town. Goods must often be unloaded at the front of premises and usually within normal working hours, and passengers must be picked up and set down. A survey of stationary vehicles should distinguish between those halted for these more necessary purposes and other standing vehicles.

33 A survey has been made of parking and waiting facilities available to the general public, and of standing vehicles, within a radius of 660 yards from Christ's College gateway—within, that is, a walking distance of about half a mile from the Town Centre. It was considered that parking facilities farther out only benefit their immediate neighbourhood and would not normally be used by persons visiting the central area. The survey comprised four counts, two on Friday and two on Saturday. The result of all four counts is given in Table G, the results of the highest count of motor vehicles (3–4 p.m. on Saturday) are shown on Map 52, and of cycles on Map 53. The Table and Maps will be especially useful to those whose duty it is to maintain a fair balance between the interests of the general public, of motorists and cyclists on the move, and motorists and cyclists who want to stop.

Motor Vehicles

34 Table G shows up the very different car-parking conditions that occur on a Friday (and presumably on earlier days of the week) and on a Saturday. On Friday about 300 motor vehicles are stationary and unattended at any one time in places other than those authorised. Simultaneously, there is enough vacant accommodation in unilateral waiting spaces, public car-parks (exclusive of New Square) and in commercial garages to accommodate all of these 300 vehicles. The Lion Yard car-park has a capacity of 180 cars and on the Friday morning it contained 89 cars. This most central car-park alone could therefore have accommodated nearly a third of the 300 vehicles parked in unauthorised places.

35 The position on Saturday is very different. In the morning some public and commercial parking accommodation is vacant, but in the afternoon both these types of park are full and 480 vehicles are parked and unattended in unauthorised places. Over 100 unilateral waiting spaces are vacant on Saturday afternoon, but this is easily explained; Saturday visitors want to stay in the centre for a considerable time and therefore avoid spaces where waiting is limited to a 15-minute period.

36 The distribution of standing vehicles on Saturday afternoon is shown on Map 52. The obstruction caused by these vehicles to general movement in the central area is not so great as it would be if it occurred on Saturday morning or an earlier day of the week. Little goods delivery takes place on a Saturday afternoon, offices are shut, University traffic is largely transferred to other areas of the town and a proportion of Cambridge people avoid going to the central area at that time. The state of affairs on Saturday afternoon has, however, been shown, in preference to that occurring on Friday, because it is thought that it represents conditions which are likely to arise on earlier days of the week directly petrol becomes more plentiful.

37 The Map shows that the spine and the loop round Trinity St. have been kept fairly free but that other streets are very full. Petty Cury and Hobson St., both one-way and narrow, are much encumbered and the big car-parks are full. The relative emptiness of the 20-minute unilateral waiting spaces will be specially noted. These spaces are, of course, sited in places where standing vehicles will cause the minimum obstruction, but the time limit makes motorists seek other and sometimes less suitable places when they want to leave their cars for long periods. The distribution of standing vehicles on Friday has also been plotted on a map (not reproduced). The main differences between Friday and Saturday conditions (apart from the much smaller number of cars in off-street parks) are the greater use on Friday of unilateral waiting spaces and more parking on the west side of the central area—Mill Lane, Queens' Lane and Trinity St.

Cycles

38 The number and approximate position of all pedal cycles stationary within a radius of 660 yards from the Town Centre were noted during the same four one-hour periods, and the distribution during the peak hour—11 a.m. till noon on Saturday—is shown on Map 53. The total number stationary at that time was 2,534. This is a large number; end to end 2,500 cycles would make a line nearly three miles long.

39 The problem of stationary cycles in the central area is ancient and difficult, and (unlike that of motor cars) it is one in which the majority of the population is directly concerned on both sides. Unless in a proper rack, stationary cycles are very apt to fall in wet or windy weather and to scratch buildings when leant against them. They are also a considerable obstruction, and can be most annoying, especially where footways are narrow; and they help to cause street accidents. On the other hand a great deal of the convenience of a cycle lies in one's being able to leave it—at least for 10 minutes or so—at or outside any premises at which one has to call; and this may be called an almost universal Cambridge habit.

40 Provision is made in Cambridge for parking cycles without charge within the curtilages of most buildings where there is a demand for it and where the necessary space can be provided at a reasonable cost. The cycles counted are largely those of people calling at premises where this provision cannot be made. The use of cycle-parks where payment has to be made is probably confined to those owners who work in premises that cannot accommodate cycles and to a few other persons making lengthy calls in the area.

41 Map 53 leaves no doubt that stationary cycles add much to congestion in an area of narrow streets, narrow footways and heavy traffic. The number of cycles at certain points is too great to be shown by separate dots and has been shown by figures. Although the Cambridge public is tolerant of this form of obstruction and great use is made of courts and passages, it is thought to be one which street improvements should try to reduce; and that every future improvement should make some contribution by providing more cycle-parks, or by other means.

BUS TRAFFIC

42 Bus traffic in Cambridge can be conveniently divided into two types: *local buses* which have fare stages and halts within the Borough and ply on routes of which every part is within about three miles of the town centre; and *country buses* which are part of the general bus network of East Anglia, but which, as far as Cambridge is concerned, have the main function of carrying country people to and from the town. Country buses do not carry passengers between two points within the Borough. All the local buses and four-fifths of the country buses are run by the Eastern Counties Omnibus Co.

43 Map 54 shows all routes within the Borough which carry one bus an hour or more. Local routes are shown in *red* and country routes in *black*. The thickness of the lines is proportionate to the scheduled number of buses that run on each route on a normal weekday. The actual number of buses run is greater than is shown, as relief buses are run on busy routes at peak periods of demand.

44 A comparison of Map 54 and the results of the population survey made by the Department in 1948 shows that local bus routes and frequencies are disposed in proportion to the population of various districts and therefore to normal demand, and there is no reason to doubt that routes through the central area are those most suited to passengers' convenience. In considering the possible contribution that could be made to the relief of congestion in the centre by the re-routing of local buses, two matters seem to deserve special attention. The first is the large number of local buses that run through Magdalene St. and Trinity St.—a number which, because of reliefs at peak periods, may be twice as many as the " scheduled " number shown on Map 54. The second is the congestion caused by bus queues and stops at the Town Centre, especially outside Lloyds Bank and Christ's College. Over 100 persons may be in a queue for a single route at these points and the total queue frequently occupies practically the whole width of the footway for 50 yards or more.

45 A very slight examination is enough to show that the siting of every local bus stop in central Cambridge has been very carefully considered, and it is therefore probable that any large change in local bus routes and stops must await some considerable improvement in the street pattern. Since buses are under a large measure of public control and a bus causes much more obstruction than the average motor vehicle, it is always tempting to seek a solution to congestion by a drastic re-routing of them. This temptation grows less when one remembers that a single bus can carry 25 times the passengers carried in the average motor car, and that buses, unlike motor cars, directly serve the whole population.

46 One other feature of local buses in Cambridge deserves mention. This is the variation in number of passengers according to the weather. In wet weather many of Cambridge's cyclists like to travel by bus and the resulting sudden rise in demand is very difficult to meet, and cannot always be met on all routes.

47 The most striking feature of the country bus routes, shown on Map 54 in *solid black,* is that not one of those carrying one bus an hour or more runs through the central area. Over 300 buses enter or leave the Drummer St. bus station every day and the avoidance of the narrow central streets by these large vehicles is a great contribution towards reducing congestion.

48 Conditions at the Drummer St. bus station must be called poor, if not bad, when compared with bus stations in other towns. Intending passengers have no proper shelter, turning-circles are too small and manœuvring and lay-by space is lacking. Country bus traffic has greatly increased in the past decade. Broadly speaking the number of passengers has doubled, and in view of the Government's plans for agriculture and the changing habits of country people, who are more and more taking advantage

of the improved transport system to shop and seek entertainment in the larger towns, it seems probable that further increases will take place. A much better bus station would therefore seem an improvement which will be badly needed within a very few years.

PEDESTRIANS AND FOOTWAYS

49 A number of studies of pedestrian movement have been carried out in the central area, and it has been found that peaks occur daily between noon and 1 p.m. and 4.30 to 5.30 p.m. The highest peak is reached on Saturdays at about 4 p.m. Although weather affects the normal weekday peaks it has much less effect on Saturdays. This is because the weekday traffic is mainly of those working in the centre and local shoppers, whereas on Saturdays numbers are largely swollen by shoppers from the countryside round Cambridge—who, as their expedition is weekly, tend to come in whatever the weather.

50 Pavement widths vary considerably, from under 4 feet to over 12 feet in a few places such as on the corner of Petty Cury and Sidney St. The Ministry of Transport state in their "Design and Layout of Roads in Built-Up Areas" that, in practice, a portion of pavement 2 feet wide can take a flow of only 20 pedestrians per minute—this refers to effective or unobstructed widths. The problem of estimating the effective widths of footways is complicated by bus queues, parked cycles, the area taken up by "shop gazers" and perambulators, and the fact that portions of footways immediately adjacent to buildings and kerbs cannot be used for pedestrian movement. The streets with the greatest pedestrian congestion are:—

1. Sidney St., south of Market Passage.
2. Market St.
3. Petty Cury.
4. St. Andrew's St., north of the junction with Emmanuel St.

and at certain times

5. Market Hill

and during Full Term

6. Trinity St.

Other streets such as Trumpington St. by Mill Lane are not habitually overcrowded, though in Term time when the Mill Lane Lecture Rooms are disgorging, there is a short and dangerous peak.

51 Within the central area proper the most congested places are:—

1. *Petty Cury,* which has effective pavement widths as low as 2 feet on either side and peak flows of at least 120 pedestrians per minute. When this happens, as is well known, it becomes to all intents a pedestrian way, and such buses as are routed through and the few other foolhardy vehicles which find their way there are brought nearly to a standstill. (See photo facing p. 9.)

2. *Market St.*—The problem here is similar to Petty Cury but to a less degree. Effective pavement widths are (north side) 4 feet and (south) 3 feet, with respective peak volumes of 52 and 42 per minute. As the carriageway is the main cross-link of the one-way traffic system the danger to pedestrians is probably greater than in Petty Cury.

3. *Sidney St.–St. Andrew's St.*

(*a*) Although the pavement width outside Woolworth's should be ample, this is a favourite place for shoppers to stop in knots and talk. Add to this the space taken up by perambulators and cycles and a peak flow of 70 pedestrians per minute and it will be seen that conditions are only just bearable.

(*b*) On the opposite side of the street, where the Essex and Suffolk Equitable Insurance building juts out next to Holy Trinity Church, there is a bad bottle-neck which is made worse by the tail end of the No. 106 bus queue. Often only about 3 feet of passageway is left for a flow of up to 30 a minute.

Where Sidney St. becomes St. Andrew's St. there are three bottle-necks in a short space, namely:

(*c*) Outside Lloyds Bank, where the No. 102 bus queue stands on a pavement of under 4 feet effective width and 53 pedestrians per minute try to get by.

(*d*) Opposite, where the Food Office juts out, the effective width is 4 to 5 feet and the peak flow is 71 pedestrians per minute.

(*e*) Outside Christ's College the pavement is between 6 feet and 9 feet wide. At times this is cut down to little more than 3 feet by the Nos. 101 and 106 bus queues and the pedestrian flow rises to 25 to 30 per minute.

4. *Trinity St.* has on either side an effective pavement width of about 3 feet. Peak pedestrian flows are 20 per minute on the west, and 30 per minute on the east side. There are frequent obstructions, especially during Term time, caused by people stopping to talk and coming out of shops.

APPENDIX—TABLE H

PEDESTRIAN TRAFFIC IN THE CENTRAL STREETS

Position	Approximate unobstructed width of footway (in feet)	Pedestrians per minute at peak hours	Capacity, Pedestrians per minute: M.O.T. standard
1. Petty Cury (by Falcon Yard)	North 2	70	20
	South 2	50	20
2. Market St. (by Stetchworth Dairy)	North 4	52	40
	South 3	42	20
3. (*a*) Sidney St. ..	West 3	28	20
(*b*) (Marks & Spencer's)	East 8	70	80
(*c*) (Lloyds Bank) ..	3	53	20
(*d*) (Food Office) ..	5	71	40
4. Trinity St. (Alma Mater Hairdresser)	East 3	30	20
	West 3	20	20

For position of census points see Map 55.

52 The Borough Police records and diagrams show that accidents are most numerous in areas where there is the greatest concentration of vehicular traffic and pedestrians. This is of course what would be expected. The danger areas of the town, taken from the 1948–49 reports, are shown on Map 56, and are as follows in order of number of accidents. (Note.—The figures in brackets are the number of accidents causing injury that occurred at each point in 1948.)

1. *The Town Centre*—i.e. Market Hill and Sidney St., south of Sussex St., south to and including the junction of St. Andrew's St. and Downing St. (41).

2. *The Mill Rd. shopping area* including Romsey Town (28).

3. *The Regent St. shopping area* including Hyde Park Corner (22).

4. *The Hills Rd. shopping and school district,* south to and including the railway bridge (19).

5. *The Mitcham's Corner shopping area,* including Victoria Bridge (15).

6. *King's Parade–Trumpington St.,* i.e. the University area from King's College to the Fitzwilliam Museum (15).

7. *The Burleigh St.–Fitzroy St.–East Rd. shopping area* (14).

8. *Ditton Fields–Newmarket Rd.* (9).

9. *Newmarket Rd.*, between the junction with East Rd. and Coldhams Lane (8).

10. *The junction of Clarendon Rd., Park Terrace and Park Side* (7).

11. *The junction of Lensfield Rd. and Trumpington Rd.* (6).

12. *The junction of Mill Rd. and East Rd.* (6).

13. *The junction of Hills Rd. and Cherry Hinton Rd.* (6).

14. *The Four Lamps roundabout* (5).

53 As will be seen, the list divides naturally into two groups; first, the shopping areas (1 to 7), where the greatest concentration of accidents occur, and second, points where the causes may be attributed mainly to heavy traffic, badly aligned corners and undue speed. In the second group (8) and (9) are both sectors of a main road which has mixed areas of industry and housing flanking it and debouching into it.

54 These records support the generally accepted rule that shopping crowds and heavy passing traffic conflict with each other in a very real sense. The central area is a case in point. Shopping, business and University uses are the reasons for its existence, and both from necessity and custom pedestrians and cyclists claim the greater part of the available road space. The large crowds using the congested pavements have already been mentioned. It is impossible to estimate the numbers constantly crossing and recrossing the streets, but it is observed that the largest numbers cross where Petty Cury and the Market St. meet Sidney St.

55 To widen and straighten the streets would almost certainly make matters worse. It is noticeable that awkward junctions, such as at the meeting of St. John's St. and Bridge St. and outside the Senate House, check vehicles and force them to move slowly. Before the introduction of the one-way system many motorists preferred to take other routes rather than make their way through the centre. Some of these are now finding that the spine route is slightly quicker than a detour.

56 This survey of Cambridge traffic is primarily concerned with matters of fact and not with the conclusions that should be drawn from them. These are bound to be, at least in part, matters of opinion, but it does seem desirable to stress that the numerous awkward corners and the narrowness of the streets in the central area can be looked at from two points of view; as obstructions to the smooth passage of vehicles, or as necessary brakes on vehicle speed. The most obvious example is the Senate House corner already mentioned. Vehicles now travel down Trinity St. much faster than before the one-way system was introduced and if they turned into St. Mary's St. at anything like the same speed serious accidents would certainly be numerous. As it is, the corner brings them down to not much more than walking pace.

SUMMARY AND CONCLUSION

57 The main conclusions which the Department has drawn from the studies of road and street traffic may be summed up shortly with the aid of three illustrations.

58 Map 57 shows the principal through-traffic routes in relation to the central area. This traffic is not, at present, very great and only a small proportion enters the central area. The remainder travels on one portion or another of the " inner ring "—mostly on the northern or western (and less congested) portions.

59 Map 58 is a very generalised picture of the town and main traffic flows. The central shopping and business area is shown hemmed in by University and College buildings and the chief residential districts are shown to the north, east and south. Traffic flows to and fro between the residential districts and the centre and performs a complicated wheeling movement around the east side of the central area. This drawing suggests that access to the centre from the east should be improved and that additional direct connections are needed between the various districts of east Cambridge.

60 The third principal conclusion is that a considerable proportion of the congestion and accidents on main streets in the central area is caused by obstruction of the carriageways by standing vehicles, including cars, buses on local routes, and cycles, and by pedestrians forced on to the carriageways by the narrowness of the footways. Existing conditions can be appreciated in part by study of

Maps 50, 51, 52 and 53 and by the photographs facing pages 9 and 17.

61 The survey suggests that it would be very advantageous to draw traffic off the spine—for instance any local-through traffic which is travelling right through the centre—but no single measure can solve the tangled problem. Relief routes, new shopping frontage, additional car-parks and enforcement of their use, additional cycle-parks, rear access to commercial premises and wider pavements, would all help to reduce obstruction, and it is suggested that each piece of redevelopment in the central area should make some contribution.

INDEX

NOTES :

(i) The tables of contents should also be consulted for subjects receiving extensive treatment.

(ii) Text references are to paragraph numbers.

(iii) References to letters refer to Appendix tables.

(iv) Figures in italics refer to the maps, figures or diagrams in the 2nd volume. These are numbered in a single sequence.

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